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Coastal Zone Management Plan 1975

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Prepared by
City Planning Commission
New Orleans, Louisiana

VOLUME 1-TECHNICAL REPORT

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Coastal Zone Management Plan
Technical Report
Volume 1

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The Planning Commission also wishes to thank all those agencies, organizations and individuals providing comments and advice in connection with this report.

PREFACE

This report was prepared to furnish the City of New Orleans with the initial means by which to control land uses and environmental quality within viable marsh estuary areas. Through implementation, this plan should allow the City of New Orleans to attain the following goals:

- 1) The maintenance of a high level of quality within estuary areas in particular and within the City of New Orleans in general;
- 2) the formulation of land use policies and techniques appropriate to marsh-estuary areas;
- 3) the formulation of a means by which energy resources may be exploited without adversely impacting environmental quality;
- 4) the provision of adequate open space and recreational areas for the benefit of the citizens of the New Orleans Metropolitan area, and the State of Louisiana;
- 5) to protect for perpetuity, the economic and ecologic resources represented by the natural environment;
- 6) the efficient utilization of existing governmental agencies, in a coordinated fashion, in the management of sensitive environmental areas; and,
- 7) the establishment of land use guidelines and priorities in estuary areas.

In order to receive as much input as possible from governmental agencies, civic groups, and the general public, this plan is being circulated to the agencies and organizations listed below and is available to the general public upon request; and prior to official adoption of this plan, at least one public hearing will be held. Agencies and Organizations which have been consulted include:

Forest Service, U. S. Department of Agriculture
U. S. Army, Corps of Engineers
U. S. Environmental Protection Agency

Office of Coastal Environments, National Oceanic and Atmospheric
Administration
Bureau of Outdoor Recreation, U.S. Department of Interior
Bureau of Sport Fisheries and Wildlife, U.S. Department of Interior
Louisiana Air Control Commission
Environmental Protection Unit, Louisiana Attorney General's Office
Louisiana Conservation Department
Louisiana Stream Control Commission
Louisiana Wildlife and Fisheries Commission
Louisiana Section, Gulf Southwest Chapter, American Institute of
Planners
American Society of Planning Officials
Audubon Society of New Orleans
Sierra Club, Delta Chapter
Ecology Center of Louisiana, Inc.
Environmental Committee, Goals for Louisiana
Department of Environmental Affairs, Louisiana State University
in New Orleans
New Orleans Center for Housing and Environmental Law
Tulane University Environmental Action Committee
Coastal Resources Unit, Center for Wetland Resources, Louisiana
State University
Engineering Sciences Environmental Center, Tulane University-
School of Engineering
Department of Environmental Health Sciences, Tulane University
of Public Health and Tropical Medicine
Chamber of Commerce of the Greater New Orleans Area
Regional Planning Commission of Jefferson, Orleans, St. Bernard
and St. Tammany Parishes
State of Louisiana, Office of State Planning
New Orleans Junior Chamber of Commerce
Young Men's Business Club of New Orleans
Louisiana State Parks and Recreation Commission

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On July 11, 1973, the New Orleans City Planning Commission adopted a resolution which recognized the value of the Natural Environment as an economic, recreational and aesthetic resource, and established as a matter of policy the practice of sound planning principles and the protection of the environment with particular emphasis on wetlands conservation.

The concept which the City Planning Commission developed is delineated in The Environment 1973: A Significant Urban Characteristic available from the Commission. The present report represents the first step toward translating the concept developed by the City Planning Commission into a plan of action by which the Commission's goals can be attained.

The value of the Natural Environment, in a wetlands context, has further been identified in a recent study (Gosselink, Odum, and Pope, 1973). This study placed the value to man of tidal marshes into monetary terms and concluded that wetlands have a social value equal to \$4000/year/acre and an overall income-capitalized value of \$81,406/acre. The value of the wetlands however, is now being threatened.

Many stresses are currently acting to the detriment of the wetlands of New Orleans and Louisiana. Natural stresses include: coastal erosion, marsh deterioration, subsidence, delta lobe shifts, storms, crevasses, climatic fluctuations, biological cycles, and diseases affecting fauna and flora. Stresses caused by man include: wetland reclamation, drainage projects, canals and canalization, highways, railroads and other transportation embankments that disrupt runoff and tidal change, water shed management, tributary dams, hurricane protection levees, river flood protection levees, closure of distributary channels, and urban and industrial pollution (Earle and Gagliano, 1972).

It is obvious that the time has come to manage the wetlands in order to preserve their value to mankind. This Coastal Zone Management Plan for the City of New Orleans which gives full consideration to ecological, cultural, historic and aesthetic values, as well as to needs for economic developments, is intended to provide the needed management tool.

New Orleans is located in the lower Mississippi River basin, an area containing a large number of marsh-estuary systems. The principal marsh-estuary system in which New Orleans lies is the Maurepas-Pontchartrain-Borgne system, the second most productive estuary system in Louisiana.

The geologic setting of the city is the Gulf Coast Region which, physiographically, is a part of the continental coastal plain which extends generally from Massachusetts to Tampico, Mexico. The average width of the coastal plain is 250 miles, but the Mississippi embayment extends inland some 575 miles from the Delta to Cairo, Illinois (Coastal Environment, Inc., 1972).

The coastal plain was formed over a period of at least 200 million years and is the result of an interaction of several geologic processes including changes in sea levels, fluvial, lacustrine and marine deposition, and location on the continental margin. Extensive downwarping has occurred in the Gulf Coastal plain as a result of tectonic movements of the crustal plates and sediment deposition.

River borne sediments consisting of sand, silt and clay have been deposited into the sea resulting in a gradual deltaic buildup which has slowly encroached seaward from relatively high ground and extended outward toward the margins of the continental shelf. Coastal Louisiana and New Orleans are situated upon this wedge of sediment. The results of a Sediment Survey of the area are reproduced in table 1 (Barrett, 1971a). Sediments have, in conjunction with tectonic movements, forced a downwarping of the Mesozoic Basement complex. This Gulf Coast geosyncline passes through the Louisiana Gulf Coast, directly under the New Orleans area. Associated with the geosyncline are zones of active faulting resulting from the pressure exerted by the weights of the sediment deposits.

Meyerhoff et al (1968, p. 377) says:

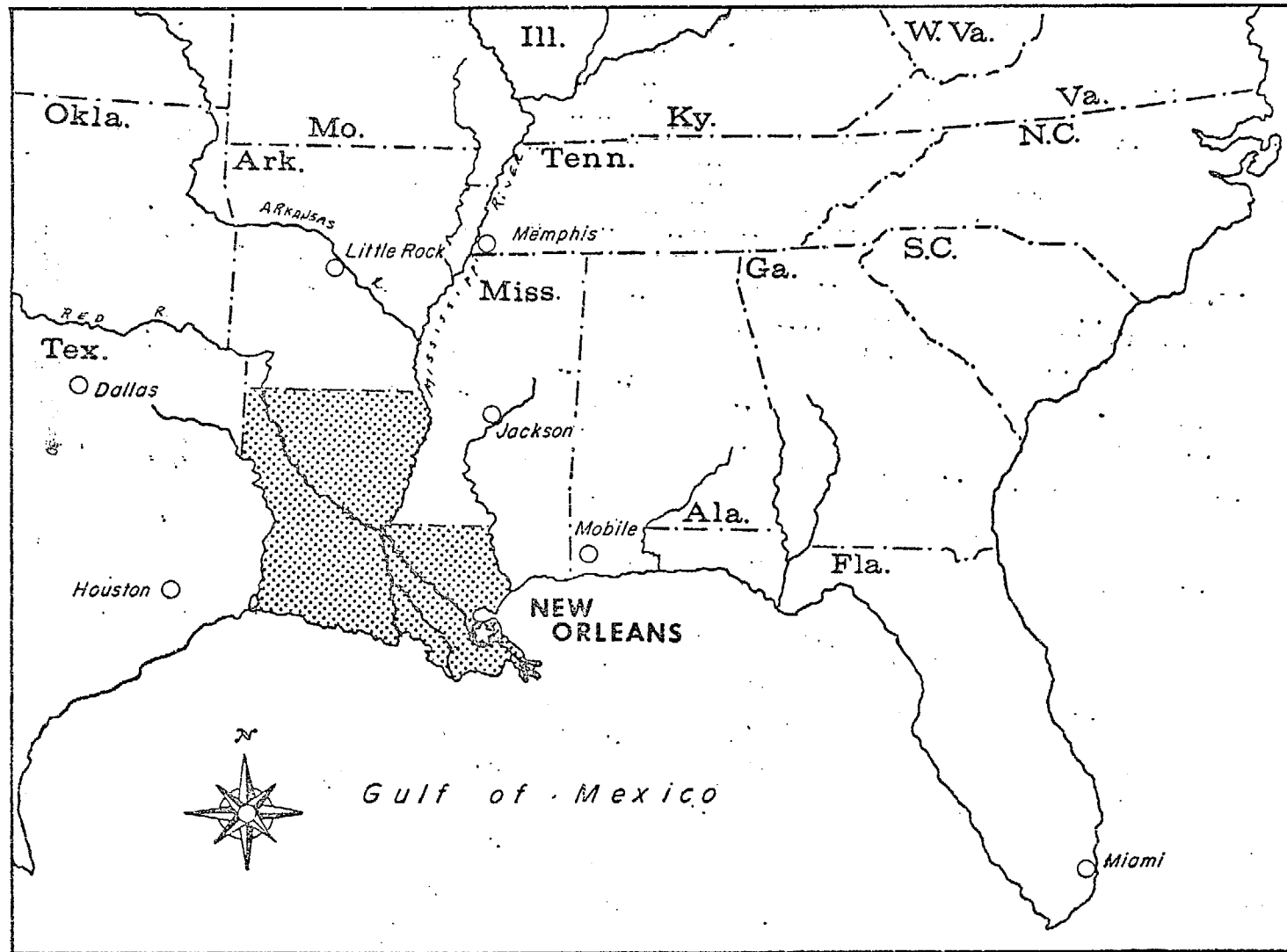
"Five basic geological factors have affected the development of the Gulf Coast geosyncline since its beginning. The first of these is the structural grain of the Paleozoic Ouachita orogenic belt which borders the north and northwest sides of the Gulf coastal plain. The lines of structural weakness inherited from this tectonic belt almost certainly controlled the geometric form of the Gulf Coastal geosyncline. Second, a depression (the Gulf of Mexico) already existed and, therefore, was accessible as a potential site of geosynclinal formation. Third, subsidence kept pace with deposition in the geosyncline.

Fourth, a thick salt sequence of Late Triassic to Middle Jurassic age imparted an important element of structural mobility to the geosyncline. Finally, beginning in Paleocene time, the rising Rocky Mountains supplied a high volume of sediments to the geosyncline".

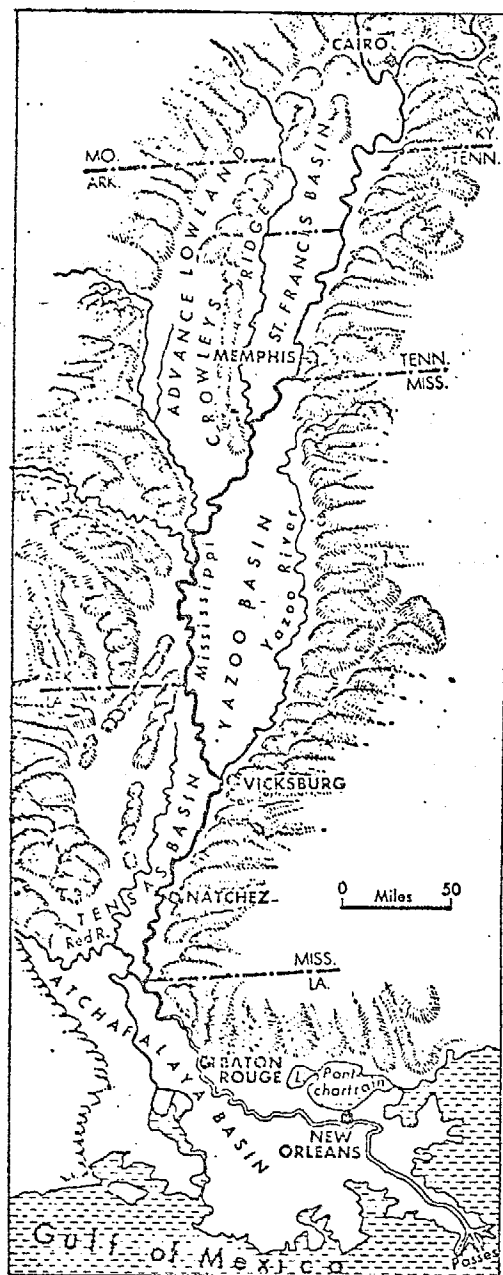
Both faulting and subsidence occurred contemporaneously with depositional processes. Deep seated beds of salt, related to an ancient Jurassic sea, and thick marine shale units have been deformed by differential loading pressures causing additional movements. These movements often initiate zones of weakness which persist as sediment continues to accumulate above them producing growth faults. These normal faults characterized by increased throw with depth and across which from the upthrown to the downthrown block, there is a great thickness of correlative section. Growth faults are one of the primary adjustments to sediment accumulation in the basin. Hence they strike parallel to the geosynclinal axis and are almost invariably downthrown on the side. Faults along the north shore of Lake Pontchartrain and underlying the lake itself are related to the regional pattern of normal growth faulting. Surface displacement of relatively modern surface features, such as beach ridges and old meander scars of streams in the area north of Lake Pontchartrain attest to the fact that some of these faults have been active within late Quaternary times (probably within the last 5,000 years).

Maximum surface displacement is found along the north shore of Lake Pontchartrain where eighteen feet of surface displacement can be documented. Two minor faults trend north-east-southwest through the study area. One of these has a near-surface displacement of five feet. Two additional faults converge near the confluence of Chef Menteur Pass and Lake Pontchartrain. Both of these faults are known to have a near-surface displacement (offset of the top of the Pleistocene) of approximately ten feet.

According to Jones (1970), "The most characteristic structural feature of the northern Gulf of Mexico basin is the growth fault. Defined by O'Camb (1961), growth faults are normal faults, which have a substantial increase in throw with depth and across which, from the upthrown to the downthrown block, there is a great thickening of correlative section. Regional growth faults, generally parallel to the axis of the geosyncline, are formed by intersecting arcuate faults whose throw may be constant for many miles; individual fault zones, with net downward displacement gulfward, can be traced for hundreds of miles. The throw may be 100m. or it may be 1 km or more; and the dip of the fault plane,



LOCATION OF NEW ORLEANS



MISSISSIPPI ALLUVIAL PLAIN
BELOW CAIRO, ILL.
(After Powers, 1966)

averaging about 50° at shallow depth, decreases progressively until the fault plane parallels the bedding plane at depths greater than about 7 km."

Associated with the formation of growth faults and geosynclinal downwarping in the Northern Gulf Coast region is the presence of a massive geothermal field. This geothermal field, buried between 45,000 and 75,000 feet below the surface, can conceptually be described as a series of reservoirs of natural steam which is trapped between fault lines, overlain by rock, and pressure heated by the weight of the overburden.

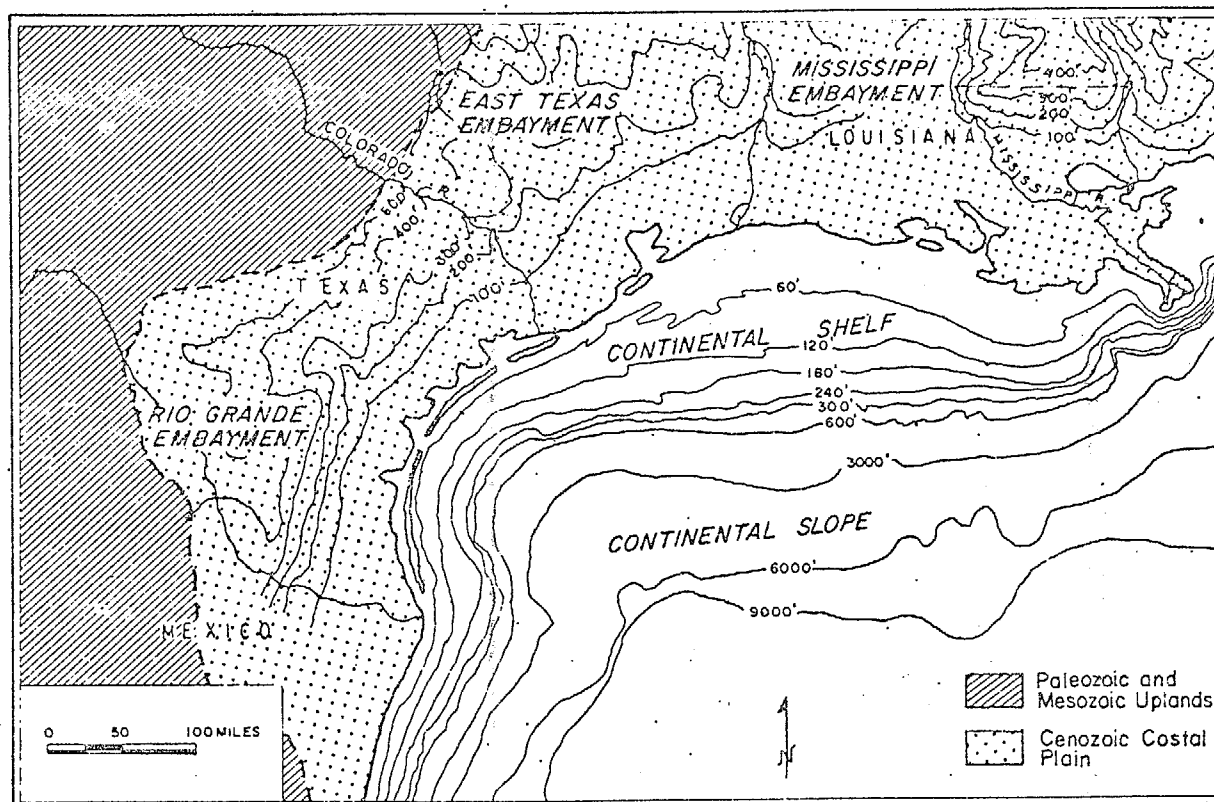
The Gulf basin is exceptionally rich in subsurface mineral deposits (oil, gas, salt and sulphur). These most commonly occur in commercial quantities where some structural trap favors their accumulation (i. e. salt dome or fault). The nearest known oil and gas fields are Unknown Pass, a few miles east of the study area, and the Goose Point Field in Lake Pontchartrain to the north.

The nature of the sedimentary deposits in the New Orleans area are important in considering urban and semi-urban land uses (Coastal Environments, Inc., 1972). The most important of these deposits in the land use context are the ancient sedimentary deposits of Pleistocene age designated as pre-prairie and prairie. (Coastal Environment, Inc., 1972, p. 10).

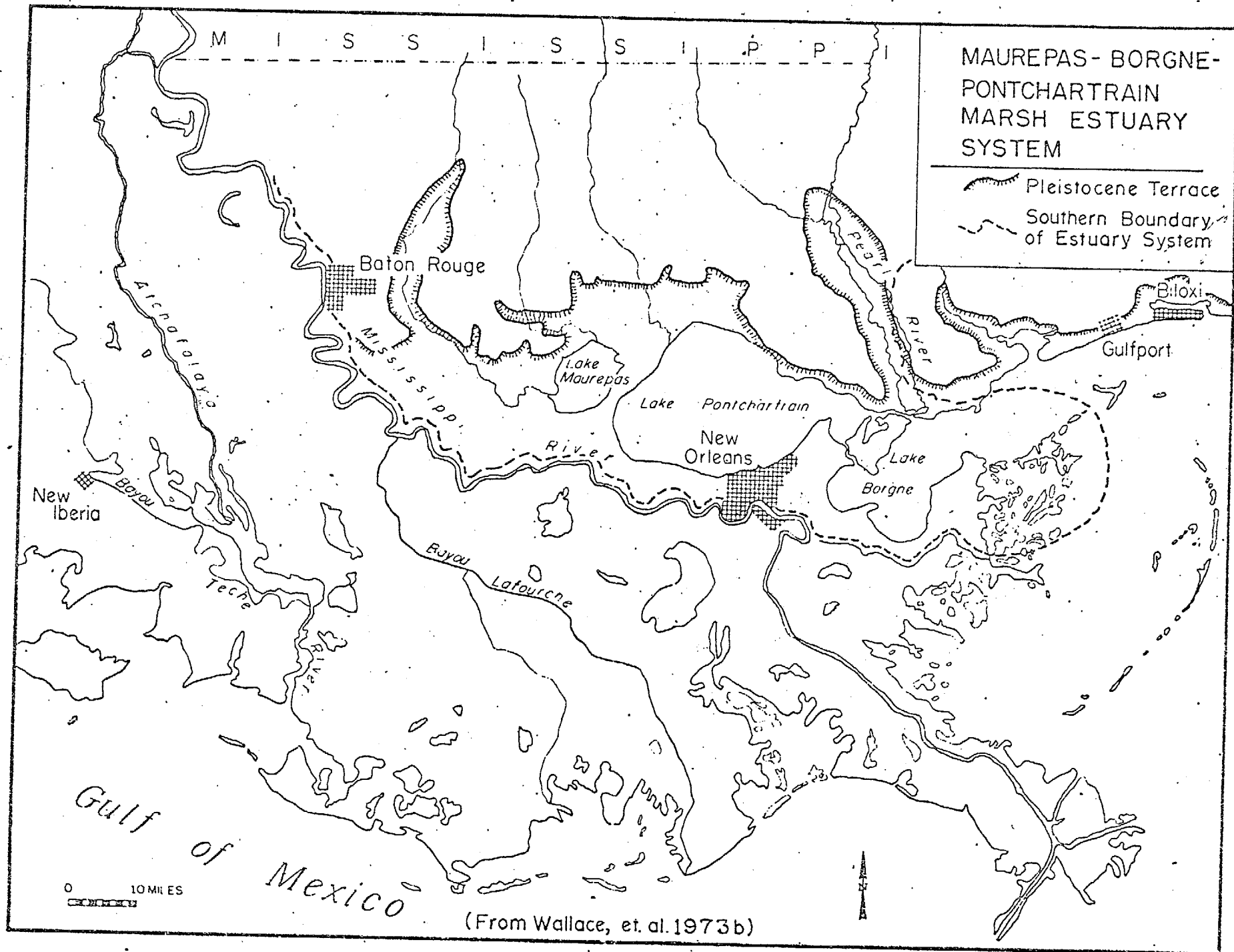
The Pleistocene sedimentation, deposited more than 50,000 years ago, consist of consolidated sands and silty and organic clays. A Coastal Environment report (1972) points out that such deposits form the best foundation characteristics in the region. The formations found at the surface north of Lake Pontchartrain, are deeply buried on the south shore by more recent deposits.

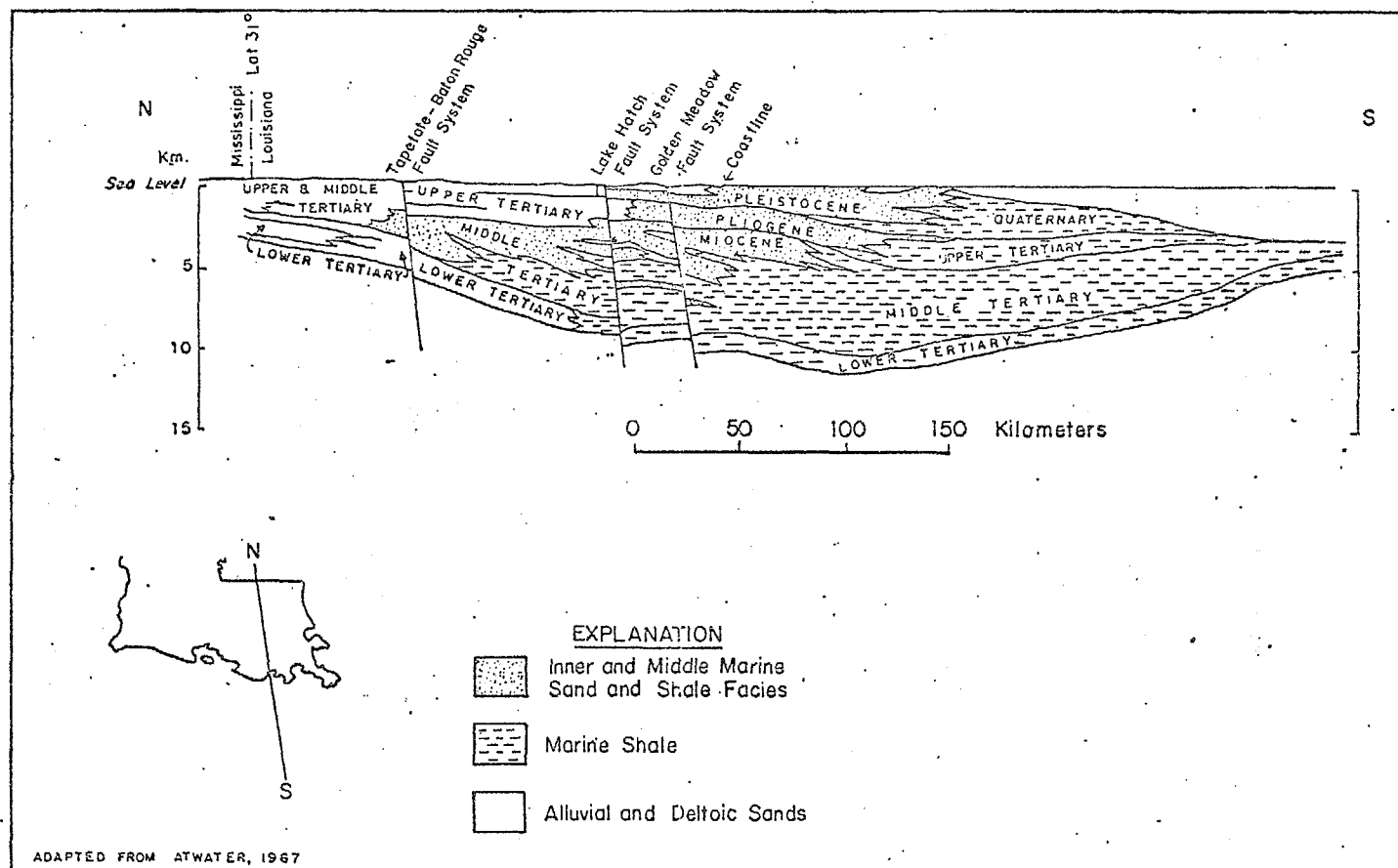
This important foundation bearing strata has been subject to constant change as the result of rising and falling sea levels, and regional tilting. About 50,000 years ago, sea level was lowered and weathering of the Pleistocene prairie caused a deep crust to form on its surface. As sea levels rose 30,000 years ago this uplifted crust became the north shore of Lake Pontchartrain.

Another type of crust was formed in what is now the Metropolitan New Orleans area during the rise in sea level 30,000 years ago. Shallow marine deposit accumulated from the north shore of Lake Pontchartrain to the Gulf of Mexico and formed a surface crust when it was exposed to weathering during a 300 foot lowering of the sea level during a period of glaciation 25,000 years ago.



GULF COASTAL PLAIN AND NORTHERN GULF OF MEXICO (Jones, 1970)





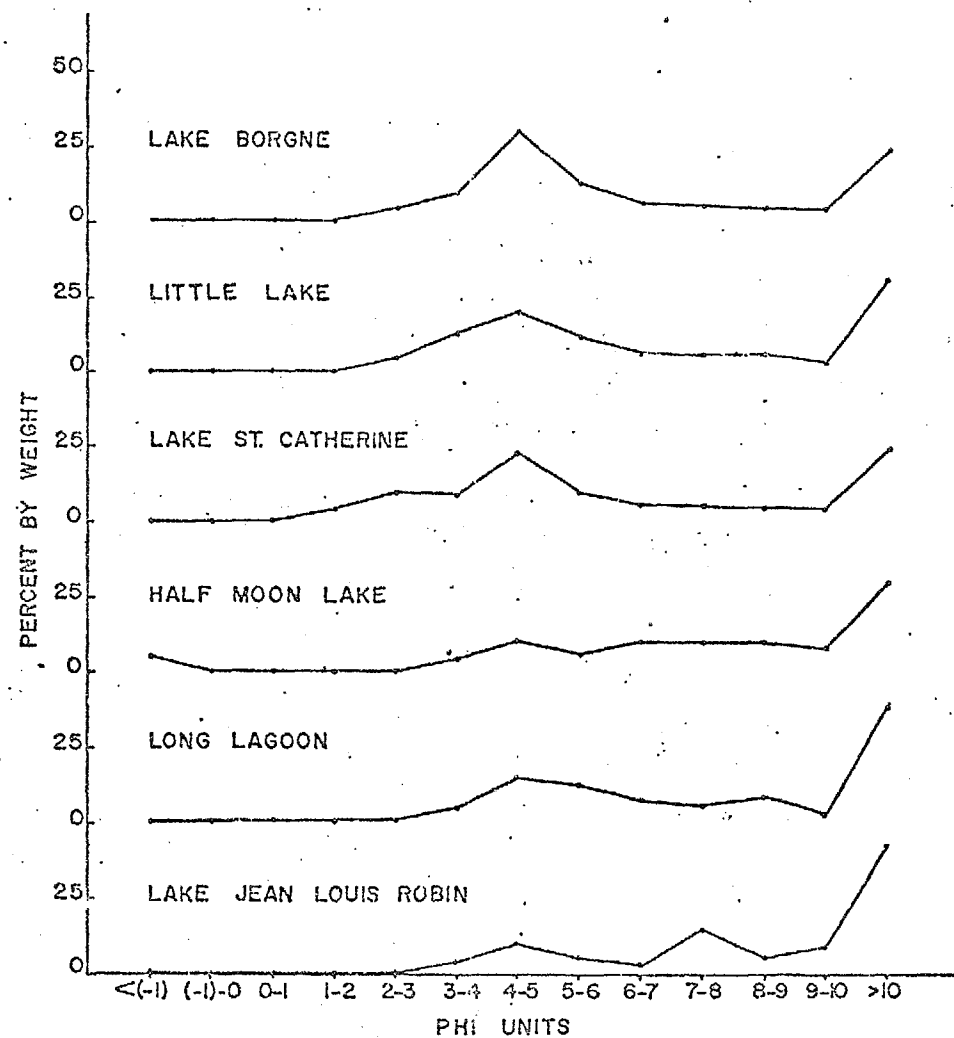
GEOLOGIC CROSS SECTION THROUGH SOUTHEASTERN LOUISIANA AND ADJACENT CONTINENTAL SHELF

Table 1

Summary of Sedimentary Characteristics of the Major
Water Bottoms sampled in the Study Area

<i>Location</i>	<i>Mean Grain Size phi</i>	<i>Standard Deviation phi</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>Percent Granules</i>	<i>Percent Sand</i>	<i>Percent Silt</i>	<i>Percent Clay</i>
Lake Borgne	Avg. 6.25	2.38	0.16	1.35	1.47	14.63	53.97	29.93
	Range 2.71/9.16	0.45/5.85	-0.77/0.80	0.50/3.94	0.00/30.55	0.00/74.74	15.42/85.81	2.85/77.49
Little Lake	Avg. 7.01	2.97	0.20	0.68	0.00	16.22	43.90	39.89
	Range 4.64/8.92	2.16/3.24	-0.58/0.61	0.52/1.65	—	2.17/65.29	18.84/57.45	15.87/65.22
Lake St. Catherine	Avg. 6.23	2.93	0.23	0.99	0.16	24.05	43.71	32.09
	Range 3.69/8.35	1.54/4.02	-0.54/0.67	0.52/2.77	0.00/2.33	1.02/71.84	15.44/70.36	10.45/66.86
Half Moon Lake	Avg. 7.28	3.40	-0.20	0.78	5.16	7.11	38.11	49.61
	Range 6.14/8.72	2.09/4.99	-0.50/0.22	0.53/0.90	0.00/12.36	1.44/15.77	27.43/51.61	40.32/61.96
Long Lagoon	Avg. 7.65	2.98	-0.07	0.57	0.26	7.25	42.27	50.22
	Range 6.84/8.35	2.69/3.27	-0.36/0.40	0.51/0.62	0.00/1.74	0.36/15.60	37.29/56.60	29.01/58.22
Lake Jean Louis Robin	Avg. 8.53	2.31	-0.42	0.77	0.62	4.26	37.45	57.68
	Range 7.68/9.37	1.75/2.86	-0.67/-0.16	0.59/0.95	0.00/1.24	3.75/4.76	29.76/45.13	49.82/65.48

(from Barrett, 1971a)



GRAIN SIZE PERCENTAGES OF THE MAJOR BODIES IN STUDY AREA (From Barrett, 1971a).

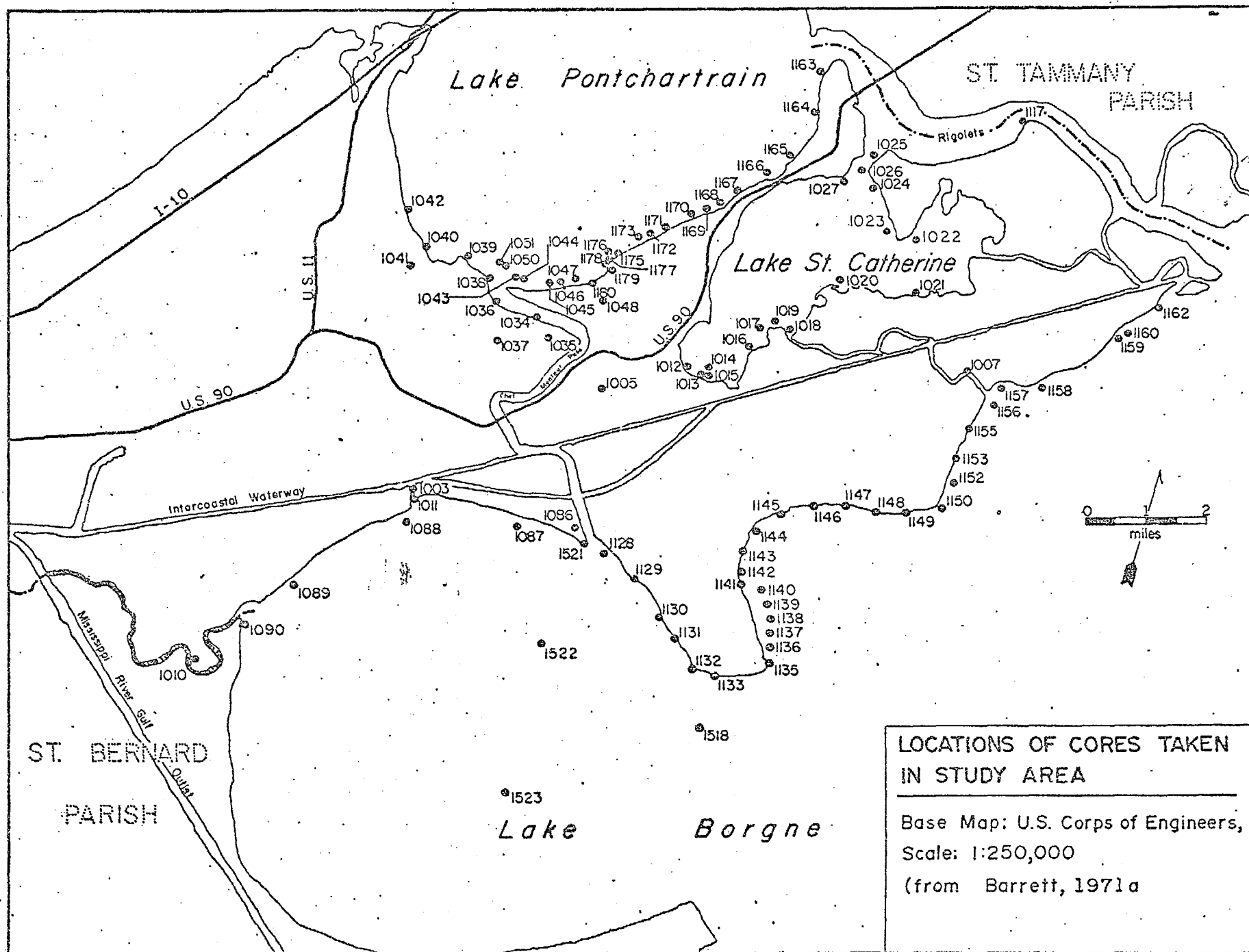
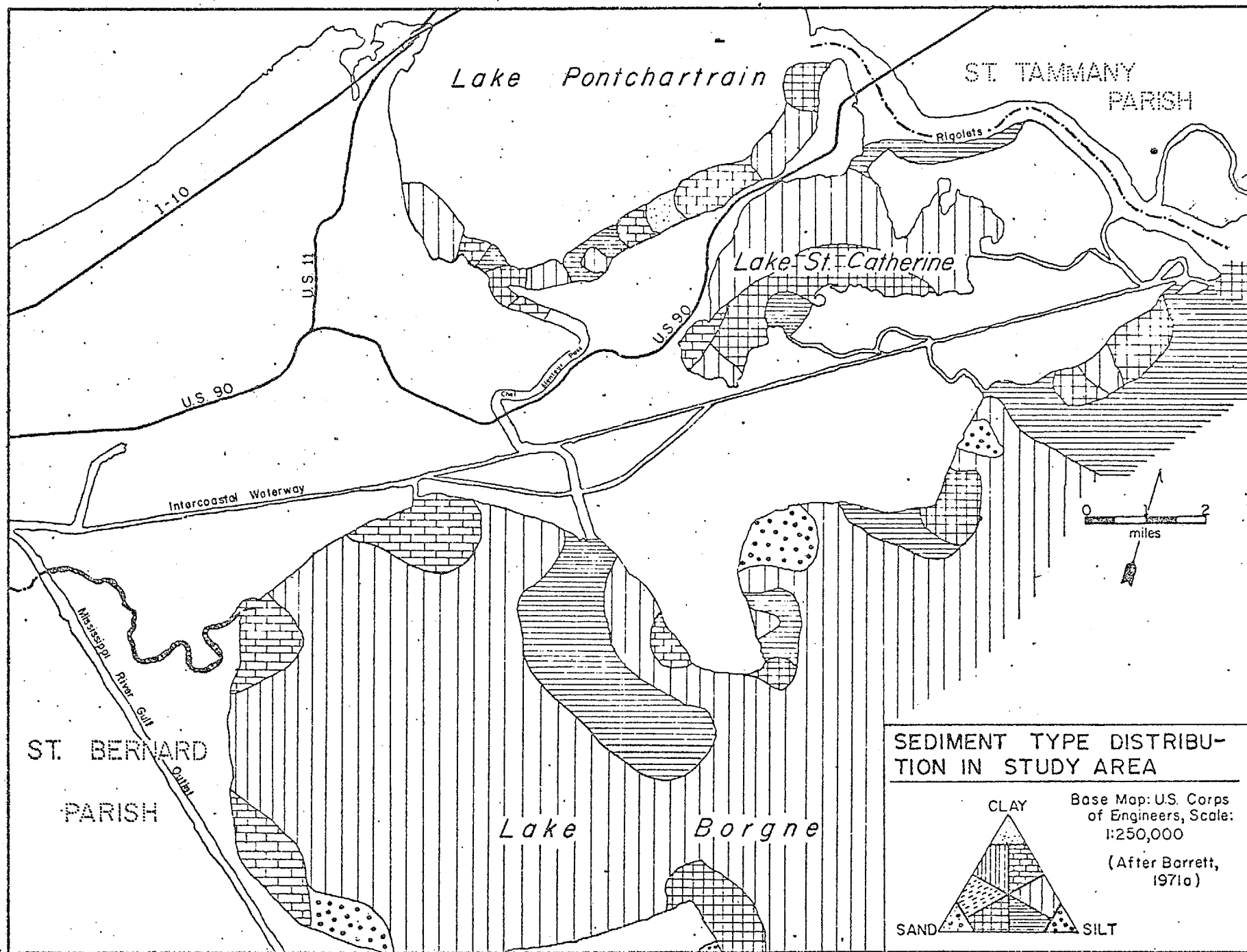
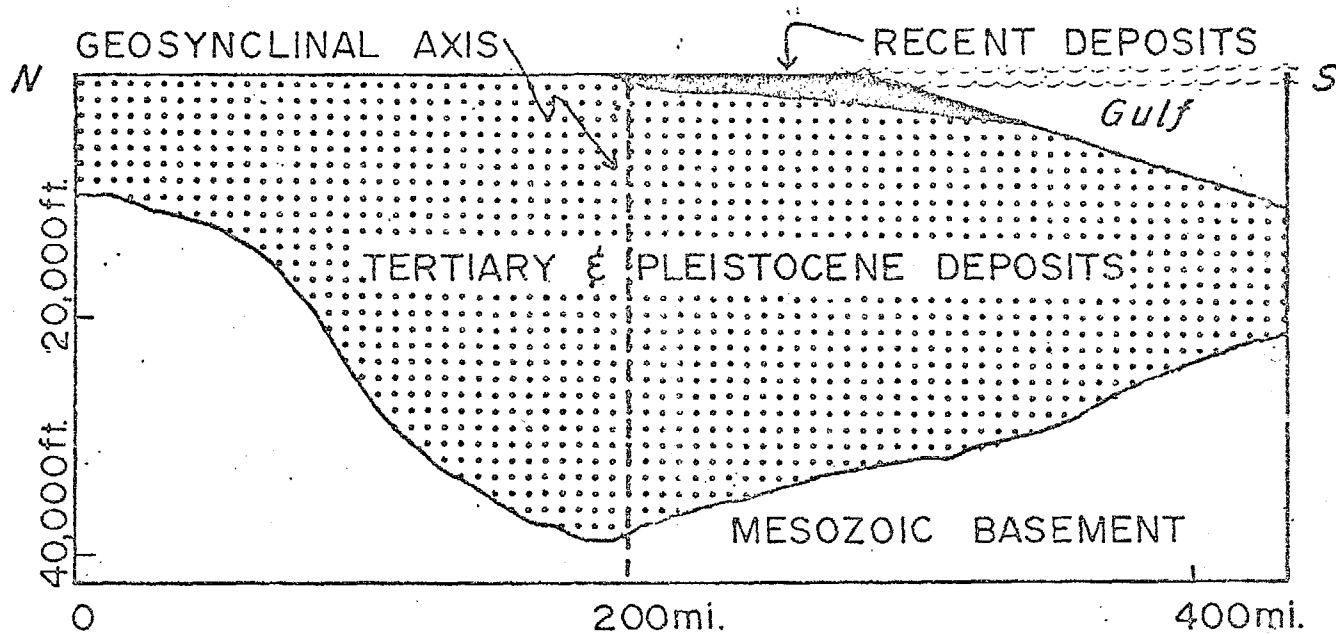


Table 2*
Sedimentary Characteristics of Samples
taken in Study Area.

*Keyed to figure 1-8 (from Barrett, 1971a)

Sample Number	Water Depth (ft.)	percent of total weight—				Phi Mean	Phi Median	Phi Standard Deviation	Skewness	Kurtosis
		Granules	Sand	Silt	Clay					
1003	3	0.0	9.57	47.87	42.55	6.77	5.53	3.18	0.58	0.51
1005	3	2.31	7.77	42.31	47.59	7.60	7.95	3.10	-0.12	0.66
1007	3	0.56	25.70	56.93	16.80	6.03	4.55	3.25	0.66	1.67
1010	5	1.12	2.68	49.22	46.68	7.54	7.66	2.87	-0.06	0.56
1011	3	0.79	6.10	39.62	53.49	7.88	8.59	3.07	-0.35	0.55
1012	4	0.0	6.42	26.74	66.84	8.35	9.31	2.71	-0.54	0.40
1013	4	0.0	3.23	40.32	56.45	7.92	8.53	2.77	-0.33	0.58
1014	5	0.02	14.63	70.36	14.99	5.40	4.61	1.77	0.67	2.77
1015	5	3.15	0.0	51.80	45.05	7.54	7.56	2.96	-0.015	0.53
1016	5	0.0	45.27	37.14	13.59	4.40	4.03	2.52	0.22	1.40
1017	6	0.04	46.54	36.66	16.76	4.77	4.16	3.29	0.28	1.13
1018	5	0.14	32.18	37.23	30.46	5.90	5.21	4.02	0.26	0.66
1019	4	0.0	44.29	45.26	10.45	4.33	4.16	1.54	0.06	2.01
1020	6	0.03	52.49	24.39	21.04	5.26	3.61	4.60	0.62	0.85
1021	6	0.0	71.84	15.44	12.72	3.39	2.70	2.21	0.67	1.57
1022	6	0.0	25.90	39.50	31.20	6.45	5.74	3.57	0.30	0.57
1023	5	0.0	11.72	59.39	28.89	6.61	5.32	3.12	0.62	0.56
1024	5	0.0	5.36	55.36	39.29	7.03	6.25	3.05	0.38	0.52
1025	6	0.02	24.18	55.13	20.67	5.96	4.69	3.10	0.61	1.02
1026	5	0.0	8.78	47.30	43.92	7.11	7.10	3.09	0.11	0.55
1027	5	0.0	1.02	58.38	40.61	7.50	7.26	2.89	0.13	0.57
1035	6	0.0	0.97	38.55	60.39	8.15	7.55	2.52	-0.41	0.63
1036	3	0.33	12.69	47.01	39.96	7.17	6.82	3.09	0.17	0.67
1037	2	0.0	5.80	43.48	50.72	7.30	8.20	3.03	-0.20	0.54
1038	3	36.03	35.03	21.67	7.22	1.93	2.34	3.27	-0.19	0.28
1039	4	0.0	10.26	32.05	57.69	7.10	8.60	3.18	-0.38	0.52
1040	5	0.0	26.27	46.08	27.65	6.49	5.56	3.35	0.42	0.60
1041	3	0.0	9.40	40.27	50.34	7.68	8.03	3.10	-0.17	0.55
1042	4	0.0	1.32	50.44	48.25	7.82	7.84	2.73	-0.01	0.53
1043	4	0.0	64.73	27.04	8.23	3.34	3.37	1.31	-0.20	1.72
1044	5	0.0	8.76	58.39	32.85	6.42	6.08	3.10	0.41	0.53
1045	5	0.0	8.73	31.75	59.52	8.10	8.88	2.84	-0.37	0.62
1046	4	0.57	16.43	47.69	35.32	6.67	5.78	3.23	0.41	0.61
1047	5	3.0	55.88	30.75	13.37	1.45	3.79	2.24	0.44	1.75
1048	3	0.05	39.12	25.34	35.44	5.21	5.04	3.59	0.47	0.53
1049	4	0.0	7.77	48.54	43.69	7.77	6.85	3.05	0.21	0.55
1050	6	0.0	51.22	31.89	16.89	5.21	3.91	3.61	0.54	1.07
1051	3	0.0	34.50	42.02	23.48	5.39	4.55	3.35	0.56	0.83
1057	6	0.0	4.63	49.20	45.77	7.43	7.00	3.05	0.01	0.51
1058	5	0.0	0.0	38.89	61.11	8.25	10.00	2.86	-0.76	0.81
1059	5	0.0	0.38	63.91	35.71	7.07	6.40	2.82	0.36	0.58
1060	5	0.0	0.47	37.91	61.61	8.43	9.48	2.12	-0.46	0.83
1117	3	0.0	33.55	37.97	28.48	6.62	4.73	3.58	0.54	0.67
1128	5	1.63	25.62	52.63	20.12	6.02	4.60	3.28	0.65	1.23
1129	5	0.39	9.04	57.30	33.27	7.23	6.98	2.66	0.12	0.65
1130	5	0.58	4.03	49.02	46.37	7.72	7.70	2.77	0.01	0.67
1131	5	0.0	5.37	42.06	52.57	7.95	8.28	2.78	-0.17	0.69
1132	5	0.25	8.27	71.43	20.05	6.23	4.92	2.73	0.72	1.04
1133	5	0.0	16.83	64.13	19.04	6.40	4.68	2.86	0.75	1.90
1135	5	0.02	59.36	23.14	17.47	4.78	3.54	3.01	0.62	1.33
1136	5	7.51	33.82	45.28	13.53	4.59	4.27	1.56	0.25	2.58
1137	5	0.04	6.74	64.02	29.20	6.91	5.85	2.81	0.67	0.73
1138	5	0.0	4.34	28.06	67.60	8.43	9.73	2.87	-0.67	0.82
1139	5	0.0	18.91	63.16	17.92	5.81	4.18	2.53	0.49	1.29
1140	5	0.85	15.33	51.81	32.00	6.18	6.03	3.18	0.36	0.62
1141	5	0.0	6.03	69.15	24.82	6.36	4.80	2.96	0.79	0.79
1142	5	1.00	13.90	66.77	19.33	5.77	4.84	2.21	0.63	1.28
1143	5	0.03	7.26	76.20	16.51	6.21	5.03	2.60	0.68	1.67
1144	5	0.04	5.23	84.86	9.87	4.98	4.80	0.88	0.31	2.17
1145	5	0.22	5.95	85.21	8.02	5.02	5.01	0.80	0.62	2.20
1146	5	0.05	9.58	81.34	9.04	4.92	4.78	0.87	0.25	2.25
1147	5	0.0	1.83	68.49	29.68	6.59	5.52	2.94	0.60	0.57
1148	5	0.49	28.47	57.10	13.43	4.97	4.44	2.19	0.36	2.00
1149	5	2.61	21.58	64.66	11.15	4.49	4.46	0.95	0.64	3.53
1150	5	0.02	68.57	25.20	5.82	5.62	1.00	1.07	0.07	2.19
1152	5	1.25	63.40	27.78	7.58	3.63	3.37	1.16	0.67	1.69
1153	5	0.0	4.76	47.62	47.62	7.66	7.78	2.99	-0.06	0.54
1155	5	0.05	7.67	80.95	11.33	4.66	4.79	0.69	0.29	2.24
1156	5	0.0	3.06	66.33	30.61	7.04	6.10	2.27	0.49	0.55
1157	5	0.01	14.42	72.62	12.94	5.36	4.66	1.68	0.63	2.16
1158	5	0.0	61.74	31.58	6.68	3.70	3.67	1.10	0.64	2.16
1159	5	0.0	18.52	48.15	33.33	6.54	5.63	3.14	0.44	0.63
1160	5	0.0	72.50	19.64	7.86	3.19	2.74	1.39	0.48	1.62
1162	5	0.0	74.74	17.53	7.73	3.06	2.65	1.43	0.42	1.93
1163	5	0.02	62.20	25.53	12.25	3.73	2.94	2.03	0.59	1.50
1164	5	0.02	19.49	62.20	18.70	5.87	4.70	2.70	0.65	1.54
1165	5	0.0	16.84	56.50	26.37	6.35	4.88	3.13	0.70	0.63
1166	5	0.0	4.21	61.16	32.63	7.42	7.03	2.52	0.21	0.59
1167	5	0.0	20.32	39.84	39.84	7.05	6.52	3.32	0.04	0.53
1168	5	0.0	11.77	35.20	52.94	7.71	8.15	1.71	-0.10	0.56
1169	5	0.14	16.28	25.67	58.50	7.86	9.62	3.55	-0.52	0.63
1170	5	0.17	15.53	26.26	53.04	7.82	8.83	3.28	-0.46	0.54
1171	5	0.0	2.23	22.35	75.42	9.26	10.06	1.69	-0.62	0.89
1172	5	0.02	14.07	65.25	20.66	6.08	4.89	2.62	0.68	1.35
1173	5	0.03	10.59	25.78	63.60	8.30	9.49	2.93	-0.61	0.54
1175	5	0.0	41.83	35.89	22.28	5.54	4.29	3.66	0.44	0.82
1176	5	0.0	31.67	48.23	20.10	5.81	4.65	3.61	0.43	1.12
1177	5	0.0	21.40	56.86	21.74	6.20	4.81	3.15	0.66	0.94
1178	5	0.0	2.12	55.56	42.33	7.39	7.03	2.69	0.18	0.52
1179	5	0.0	50.51	28.49	21.00	5.61	3.97	3.14	0.50	0.98
1180	5	0.0	35.67	42.71	20.62	5.55	4.48	3.45	0.46	1.28
1181	1	0.0	24.23	61.90	13.87	5.18	4.57	1.85	0.49	1.59
1519	1	0.0	15.93	64.06	16.01	4.73	4.73	2.15	0.52	1.68
1521	1	4.70	41.48	42.20	11.62	4.61	4.12	2.10	0.35	2.68
1522	1	0.0	28.01	60.18	10.82	4.62	4.44	1.22	0.23	2.69
1523	1	0.03	8.07	70.18	21.72	6.31	4.84	2.90	0.77	1.09





GENERALIZED CROSS SECTION OF GULF COAST GEOSYNCLINE DEPICTING DEPOSITIONAL RELATIONSHIPS.

(After Kolb & Von Lopik, 1958 and Coastal Environmental Inc. 1972)

The marine surface and the prairie crust extend from the north shore of Lake Pontchartrain through the City of New Orleans at depths of 20' to 120' below the surface.

As the sea rose again about 7,000 to 4,000 years ago islands were formed in the open Gulf by Pleistocene sands deposited by the Pearl River. These islands, similar to the barrier islands off of the Mississippi coast, were the formative base of what is now the present south shore of Lake Pontchartrain.

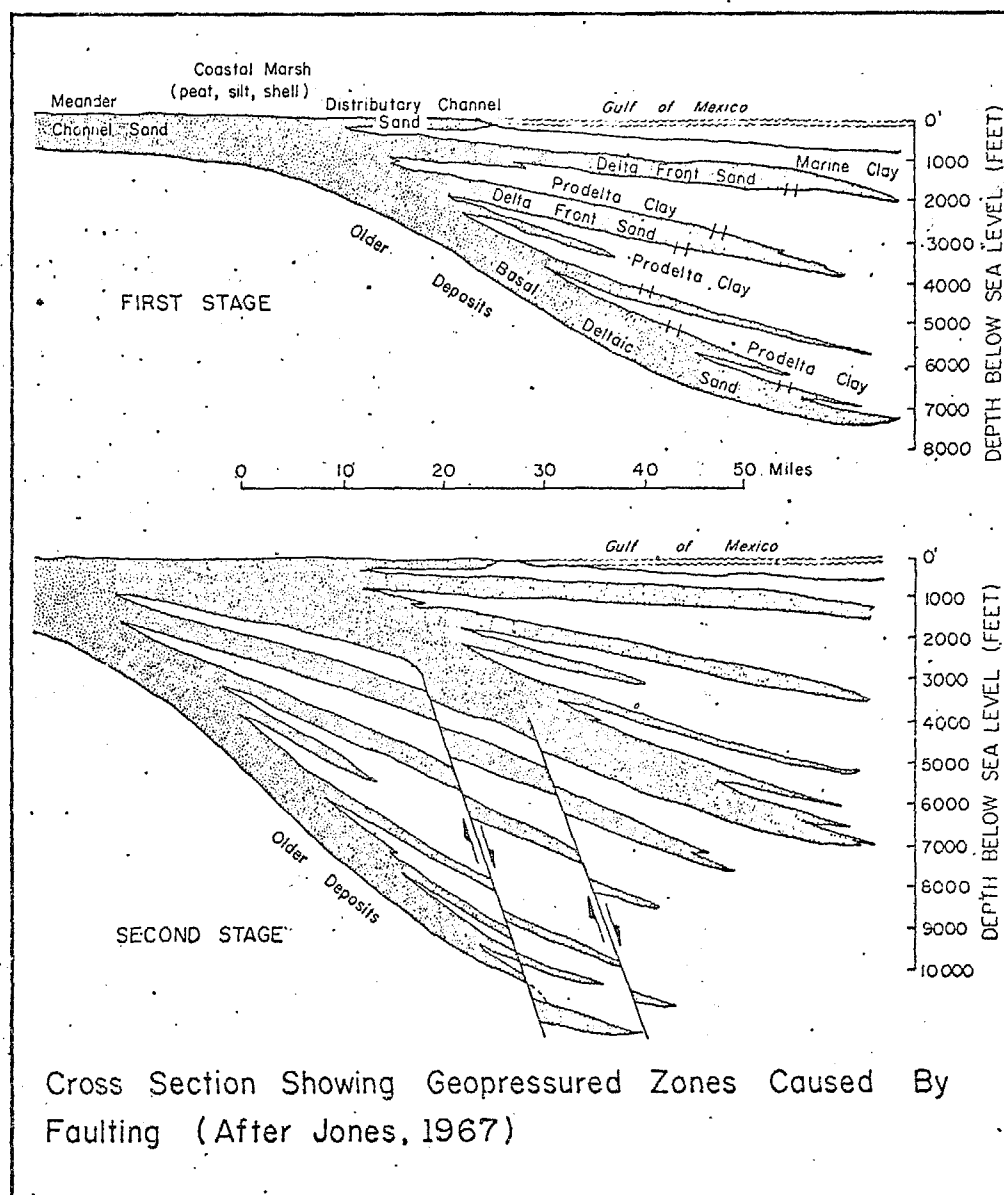
It is apparent that the formation of the Parish of Orleans has occurred during a recent geologic time with the surface 50 to 100 feet less than 4,000 years of age. 40,000 feet below this layer the sediments are 7,000 - 7,500 years old with the 40,000 foot base layer being possible 200 million years old.

Fault zones are of particular importance to note in the New Orleans area because of their affect on construction of all types. The area is extremely active tectonically and growth faults are constantly occurring as sediment accumulates on the zones of weakness. Such faults are downthrown of the Gulfside as they strike parallel to the axis on the gulf side.

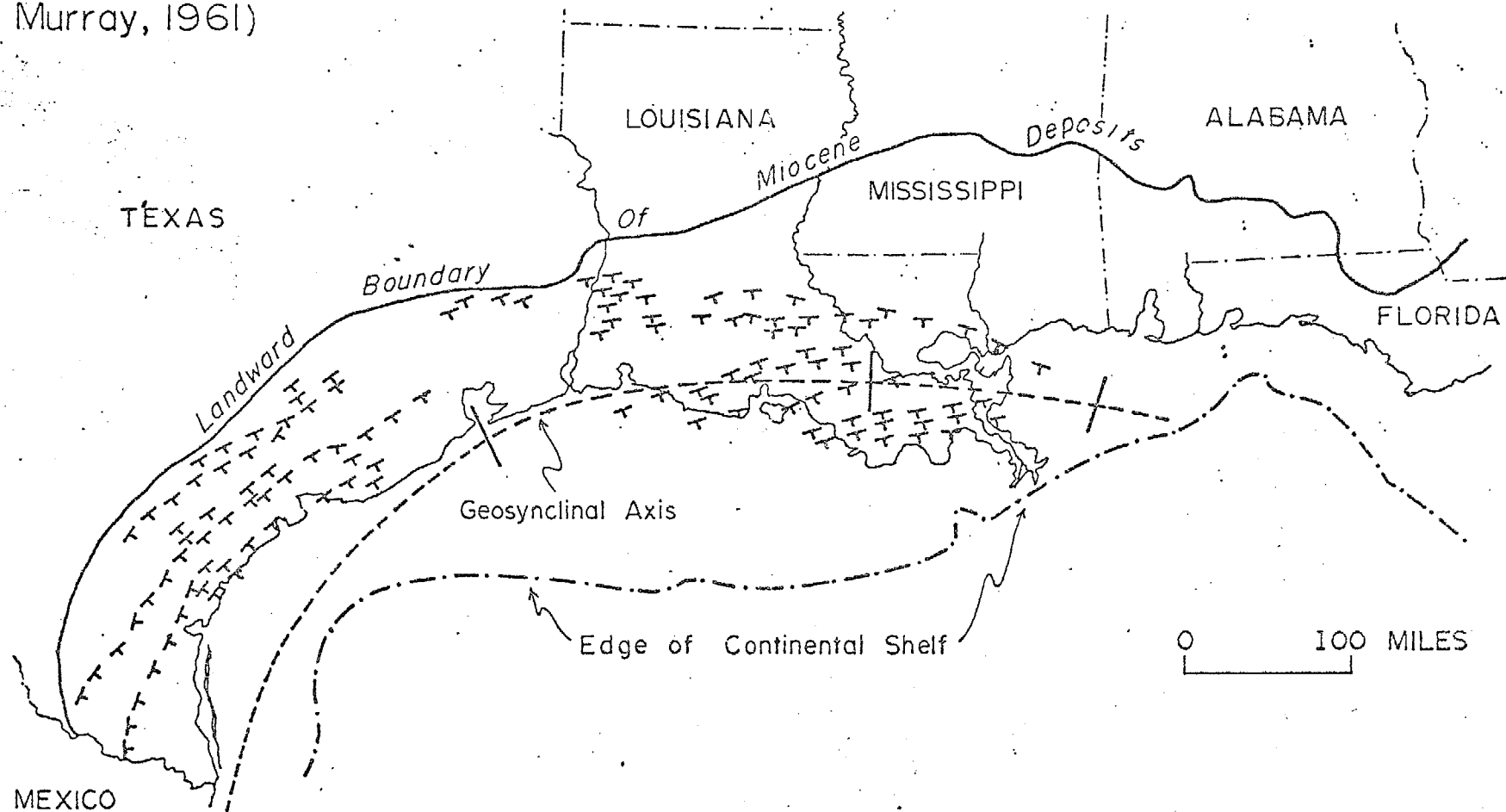
Studies conducted in coastal areas throughout the world suggest that sea level reached its present stand about 3200 years ago. Since that time only very minor fluctuations of the ocean levels have occurred. However, there has been a continuing change in relative positions of land and sea in coastal Louisiana. With few exceptions the wetlands area is sinking. A number of factors contribute to the apparent vertical movements in land and sea. Kolb and Van Lopik (1958) identify the primary factors as follows:

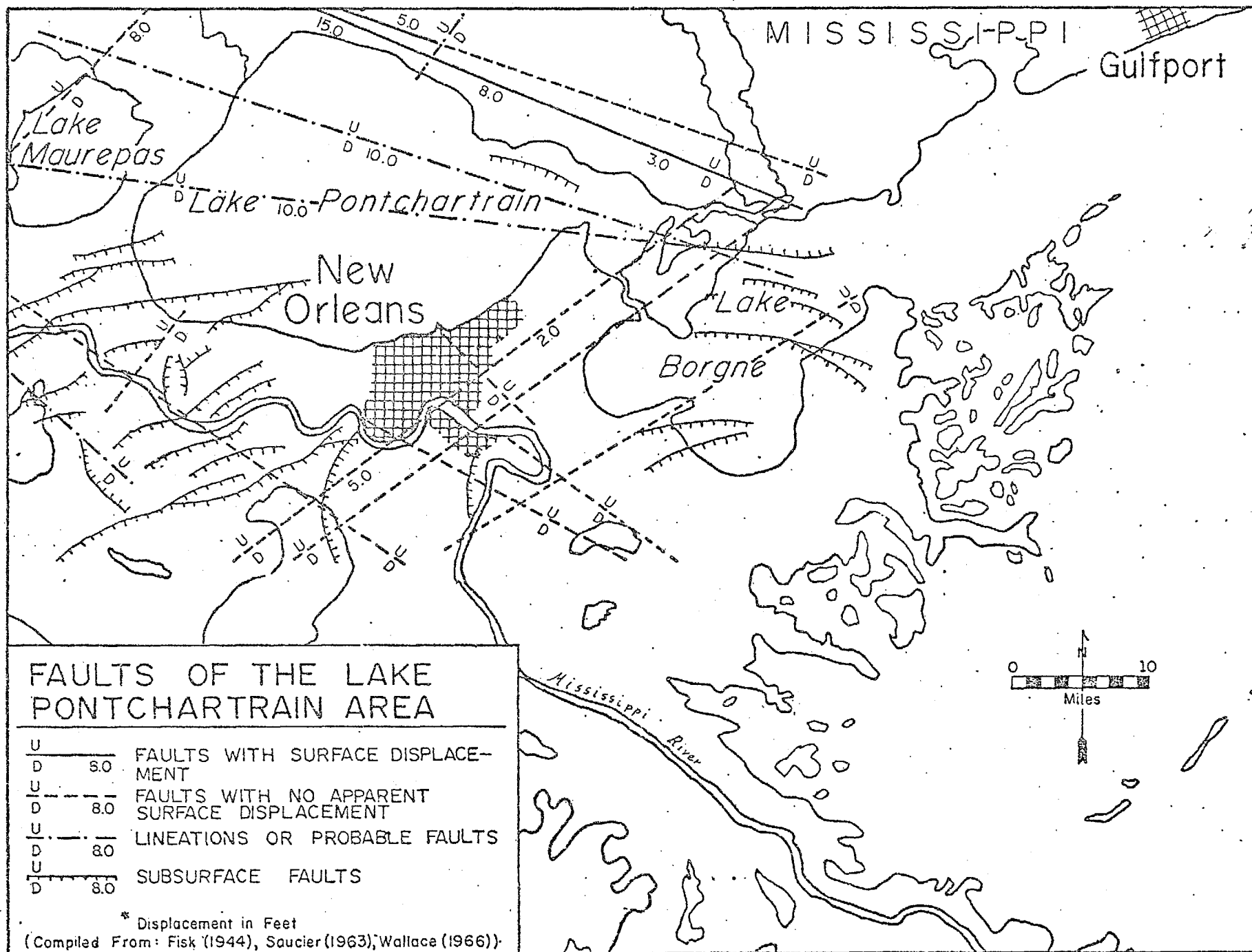
- A. True or actual sea level rise
- B. Consolidation of sediment of the Gulf Coast geosyncline
 1. Pleistocene and pre-Pleistocene sediments
 2. Recent sediments
- C. Local consolidation
 1. Consolidation caused by weight of minor landforms
 2. Consolidation caused by weight of man-made structures
- D. Basement sinking caused by sediment load and/or sub-crustal flow
- E. Tectonic activity

All of these factors contribute to subsidence within the study area. Radiocarbon dating of buried peat deposits indicate that the average subsidence rates for coastal Louisiana amount to 0.35 feet/century (Gagliano and Van Beek, 1970). Local rates as high

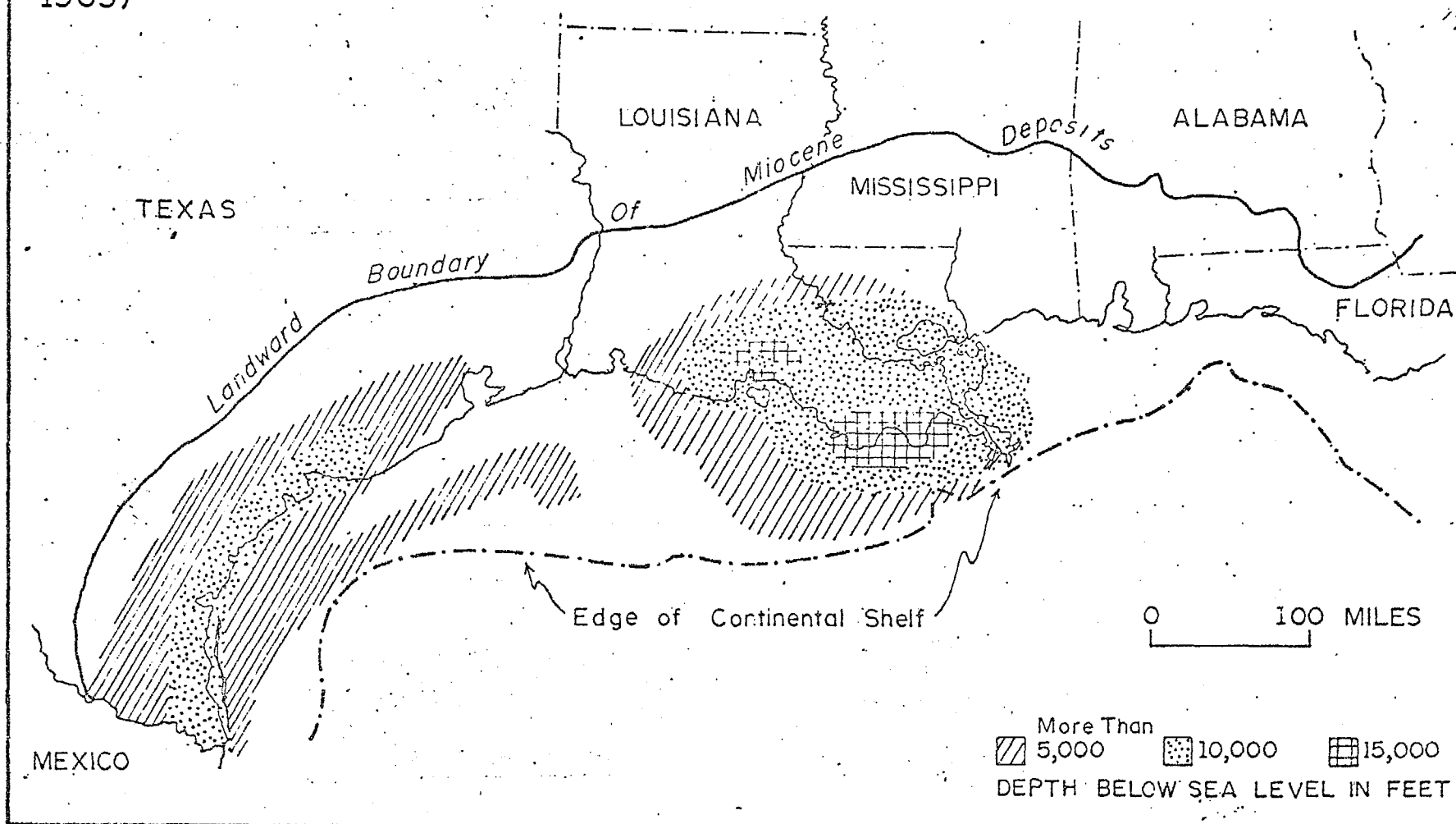


Regional Growth Fault System In
Miocene And Younger Sediments In
Northern Gulf Of Mexico (After
Murray, 1961)





LOCATION AND DEPTH OF OCCURANCE
OF GEOPRESSURES IN THE NORTHERN
GULF OF MEXICO BASIN (AFTER JONES,
1969)



as 10 to 16 feet per century have been reported (Kolb and Van Lopik, 1968). Saucier (1963), reports an average subsidence rate of 0.39 feet/century for the Pontchartrain Basin.

Local subsidence of drained wetlands areas in coastal Louisiana is a well known phenomena. When backswamp peats and highly organic clays are drained they shrink and oxidize. Sometimes logs and other organic constituents actually burn. These processes result in a significant lowering of the land surfaces. Some areas within the city limits of New Orleans are 12 feet below mean Gulf level. Elevations of more than five feet below the datum are common. It can be anticipated that within a few years after drainage most of the Eastern New Orleans area will be from three to five feet below Gulf level.

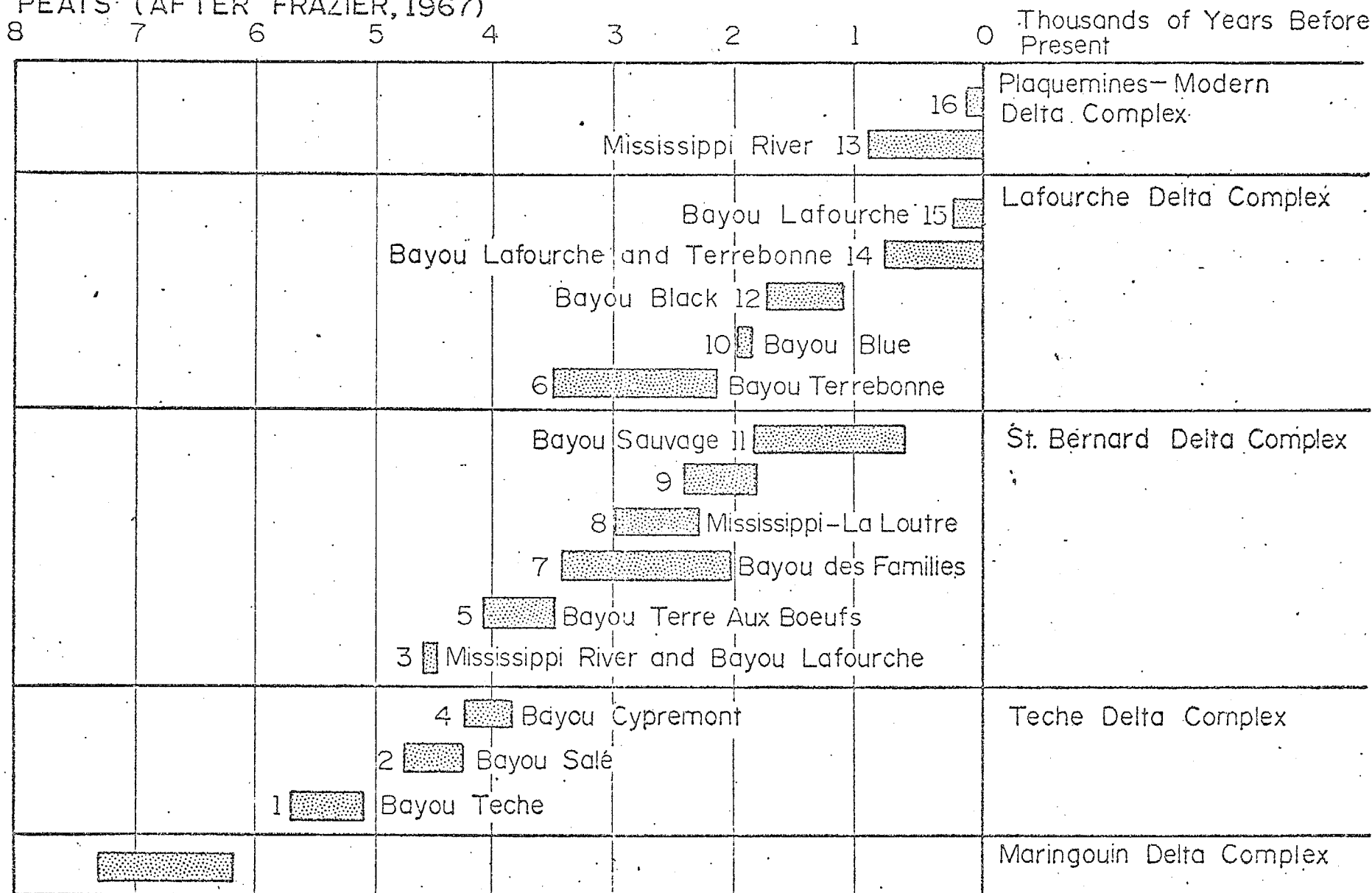
The upper 50 feet of sedimentary deposits underlying the study area have accumulated during Late Quaternary times (the last 30,000 years). Events significant in consideration of foundation conditions, ground water and surface morphology in the city are as follows (Wallace, 1973a):

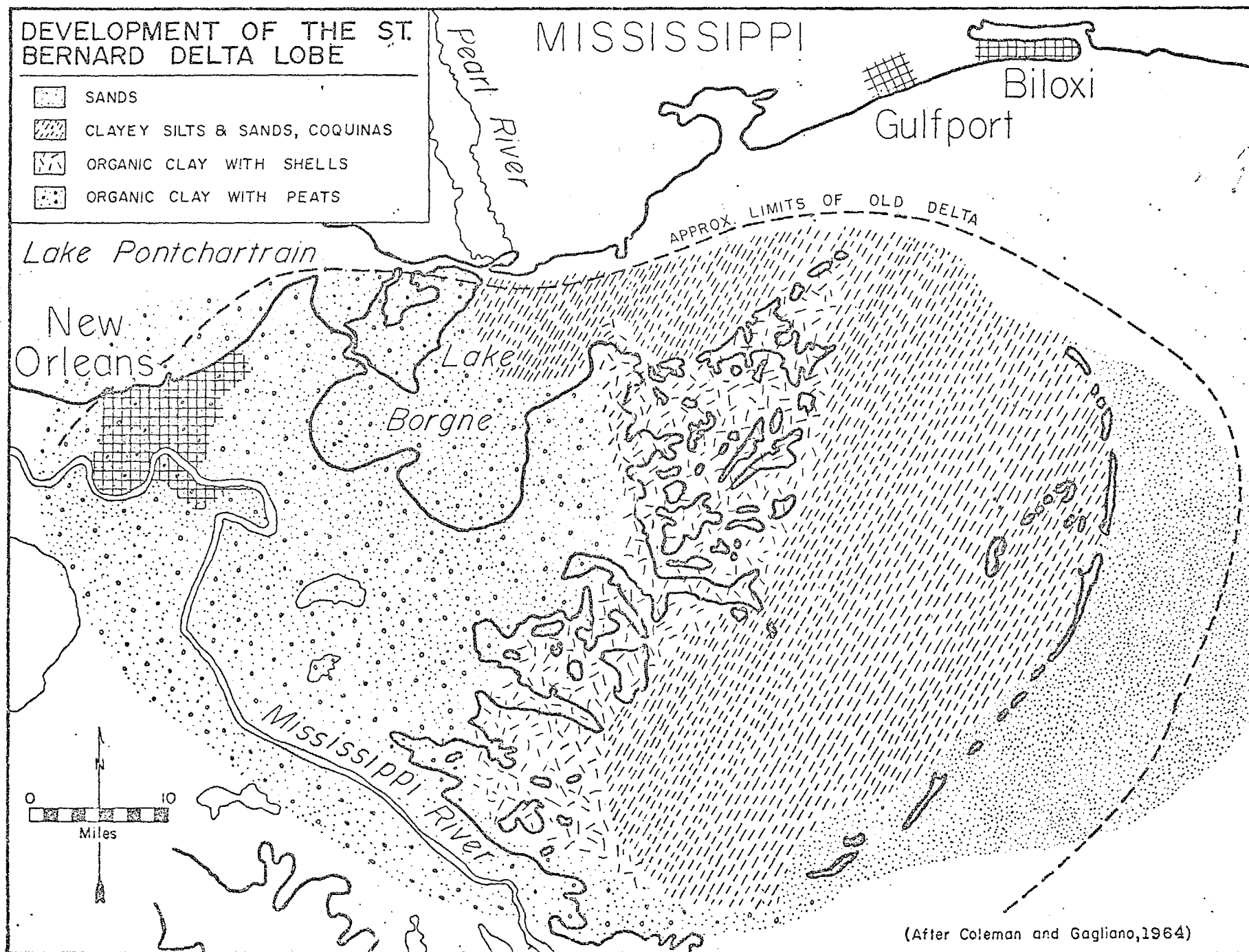
- I 50,000 years B.P. *
 - A. Sea level approximately same as today
 - B. Deposition of late Pleistocene prairie formation
 - 1. Deposited in deltaic plain and marginal deltaic basin environments
 - 2. Predominately poorly consolidated sands, silty clays, organic clays
- II 50,000 - 30,000 years B. P.
 - A. Constant sea fluctuation
 - 1. Sea level lowered 300 feet due to continental glaciation
 - 2. 40,000 B. P. sea level rises and approximates present level at 30,000 B. P.
 - B. Geomorphic changes
 - 1. Pleistocene prairie exposed and crust forms on surface which is to be major foundation base of New Orleans area.
 - 2. Regional tilting causes uplifting leaving prairie terrace high to form north shore Lake Pontchartrain

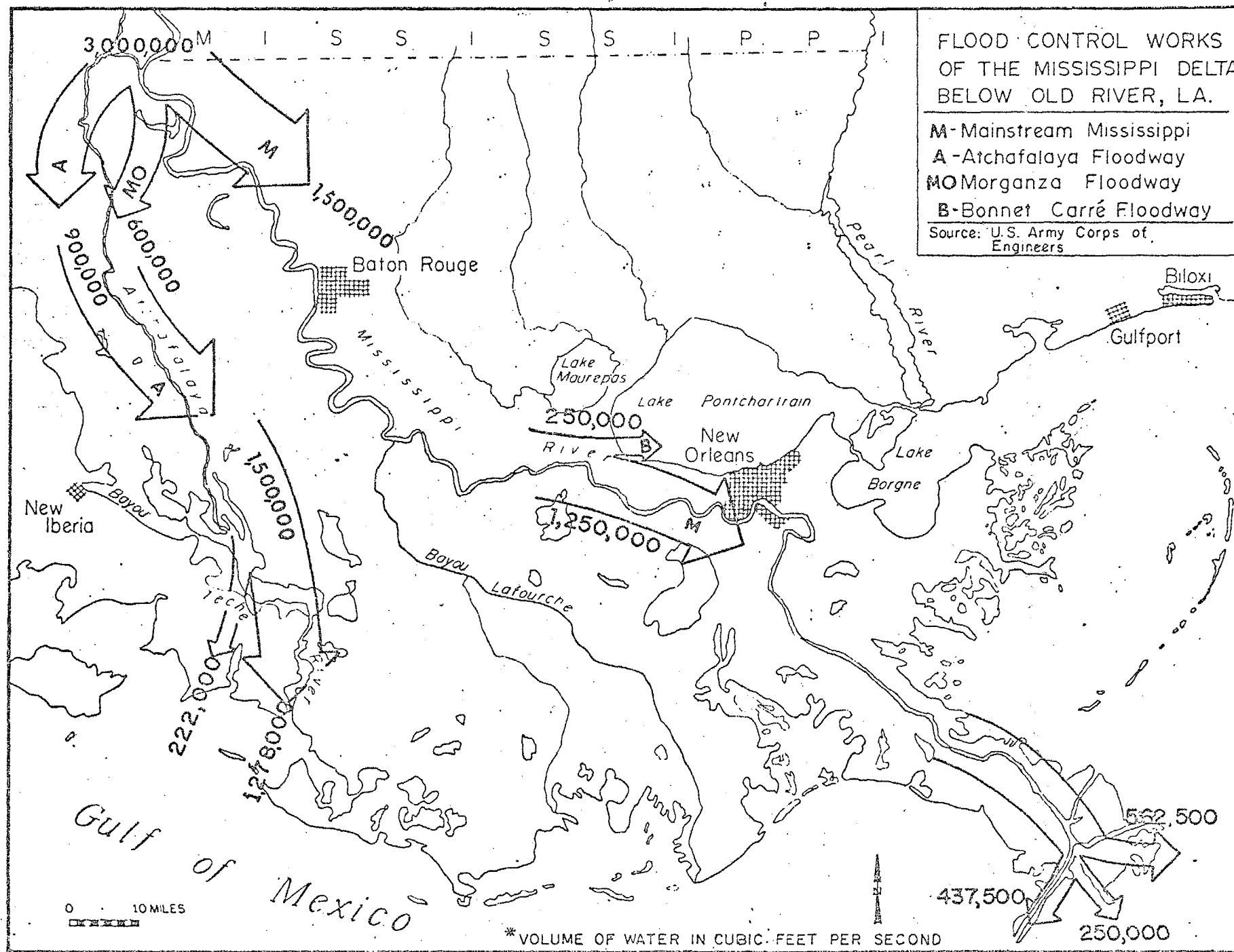
* B. P. is the abbreviation for years Before Present, the present being internationally recognized by Convention as the year 1950 A. D.

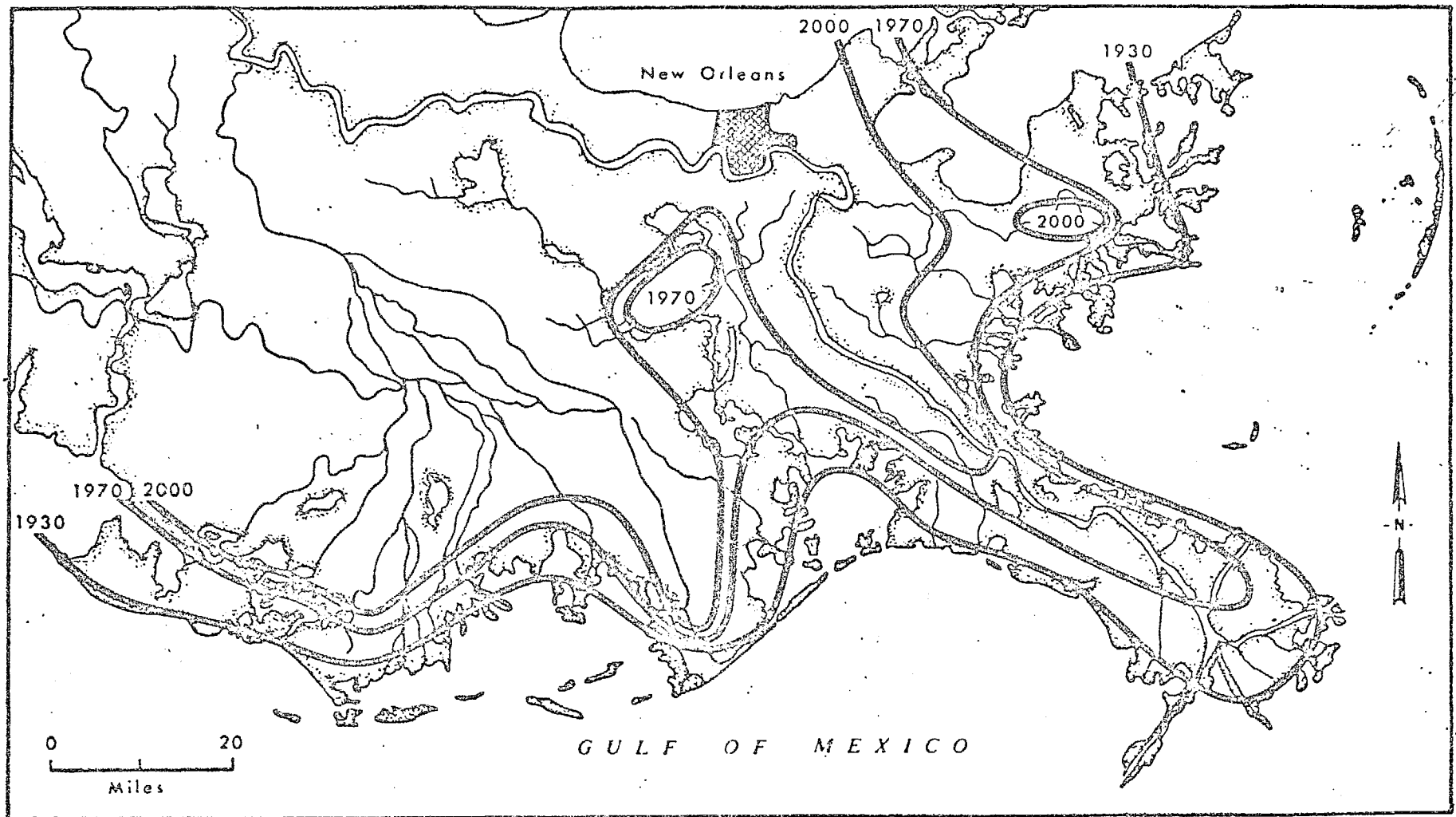
- III 30,000 - 25,000 years B. P.
 - A. Sea level approximately same as today
 - B. Gulf shoreline is sandy beach through present northern half of Lake Pontchartrain
 - C. Deweyville formation created by marine sediment accumulating over prairie formation and extends from northern shore of Lake Pontchartrain to Gulf in vicinity of City.
- IV 25,000 - 7,000 years B. P.
 - A. Glaciation causes drop in sea level
 - B. Exposure causes shallow crust to form over marine sediment
 - 1. Forms surface between 55' to 20' deep
 - 2. Most important foundation bearing strata of New Orleans area
- V 7,000 - 4,000 years B. P.
 - A. Sea level rises creating open Gulf from present north shore Lake Pontchartrain
 - B. Sea level rises
 - C. Eroding Pleistocene deposits distributed by Pearl River forms series of sand islands from mouth of Pearl South-west to New Orleans area
 - 1. Barrier islands separate Gulf from sheltered sound
 - 2. Composed of clean, well sorted fine to coarse sand
 - 3. Outcrops at Pine and Little Oak Islands sloping north and south
 - 4. Slope 20-25 feet below Gulf level at shore Lake Pontchartrain, 45' below at Intracoastal
 - 5. Used today for foundation and sand fill
- VI 4,000 - 700 years B. P.
 - A. Major deltaic lake of Mississippi River developed (St. Bernard Delta Complex)
 - B. Sequence of pro-delta, lacustrine and delta front deposits defined with emergence of natural levee ridges including the development of levees along Bayou Sauvage and Turtle Bayou
 - C. Mudflats established in flood basin and colonized by marsh grasses
 - D. Lake Pontchartrain formed
 - E. Indian occupation evidenced by middens
- VII 700 - 1720 A. D.
 - A. St. Bernard complex abandoned when Mississippi River diverted to west
 - B. Deposition of organic debris continued in swamp and marsh
 - C. Salinities increase, estuaries formed

CHRONOLOGY OF DELTA LOBES BASED ON AGE OF DELTA-PLAIN PEATS (AFTER FRAZIER, 1967)

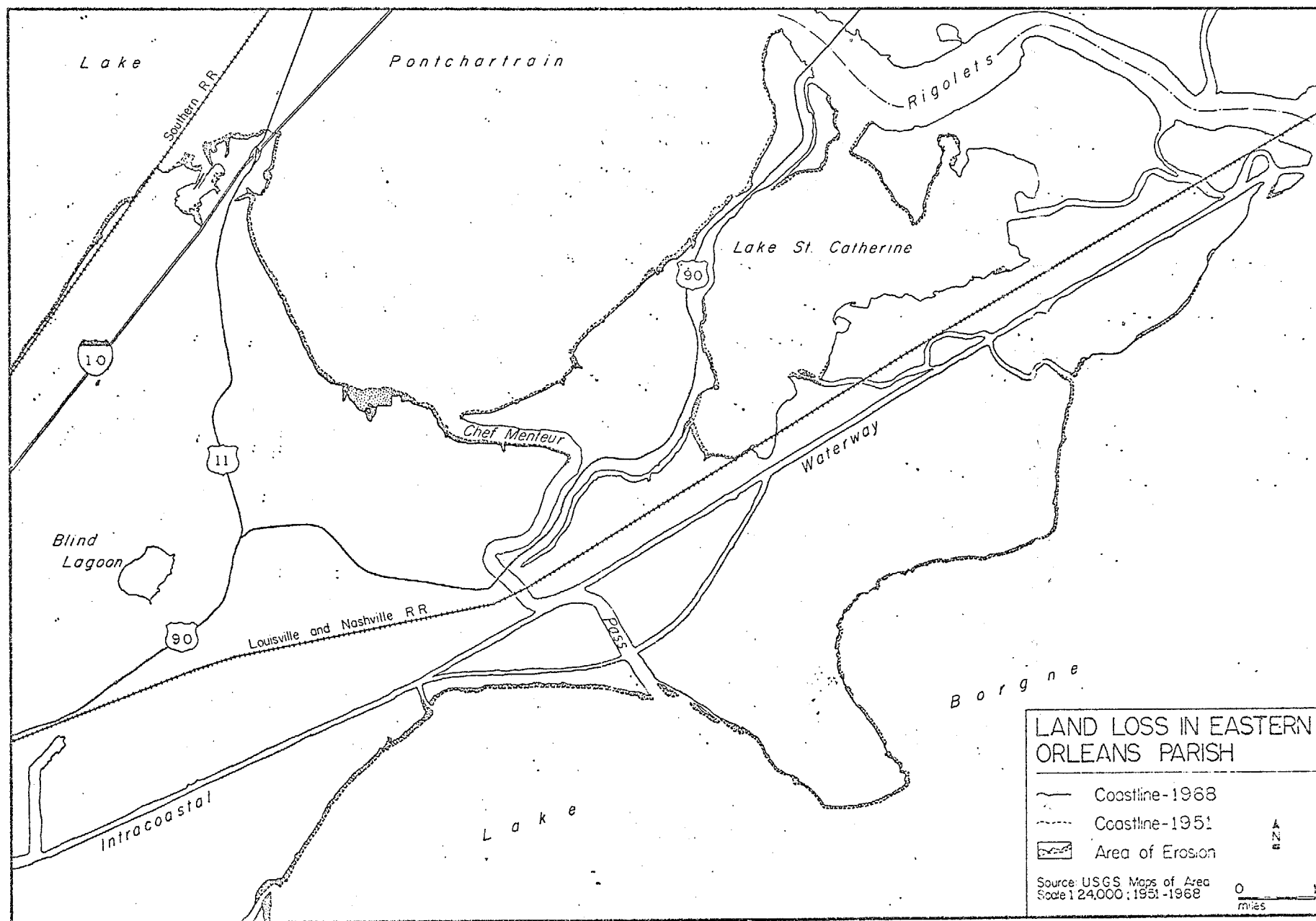


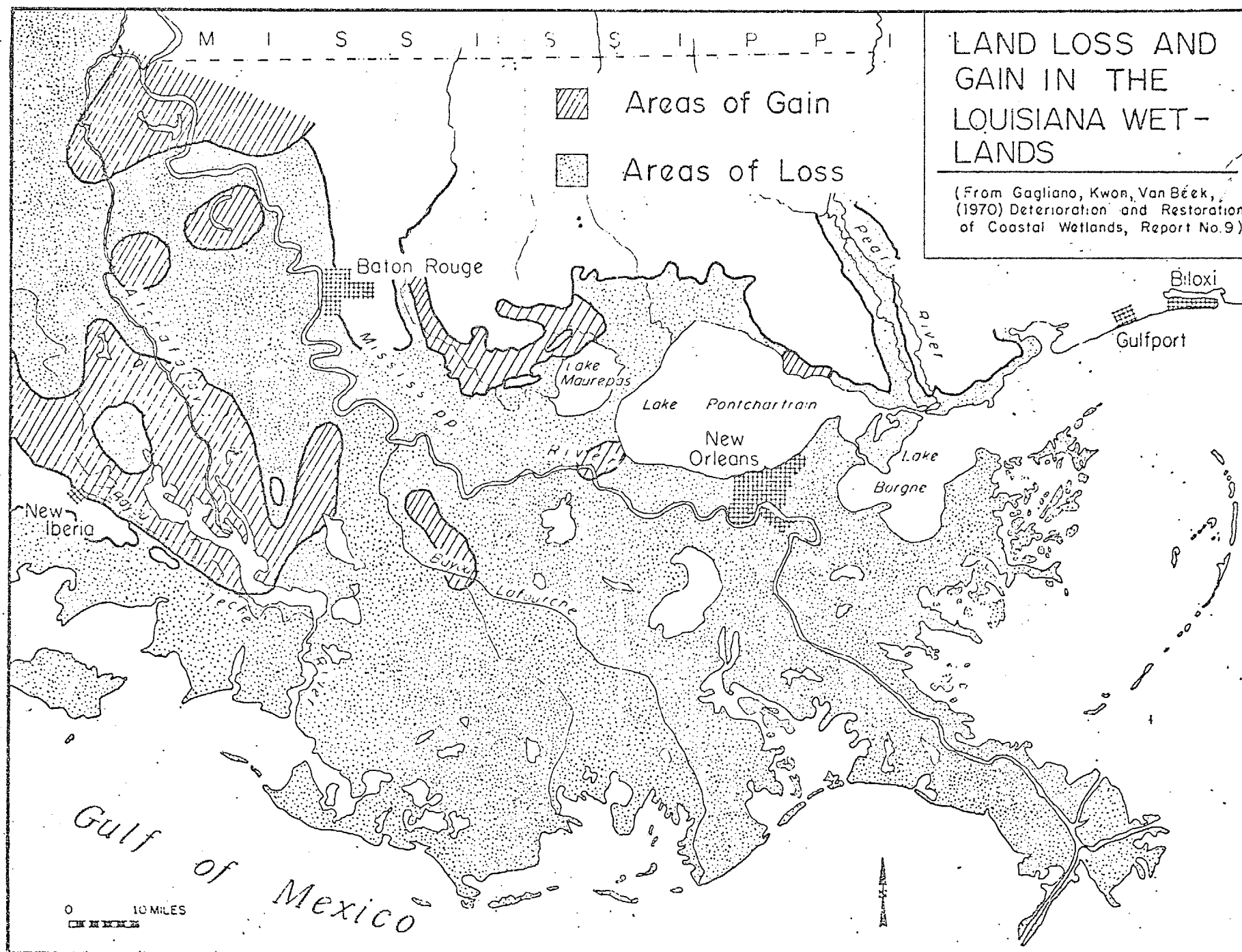


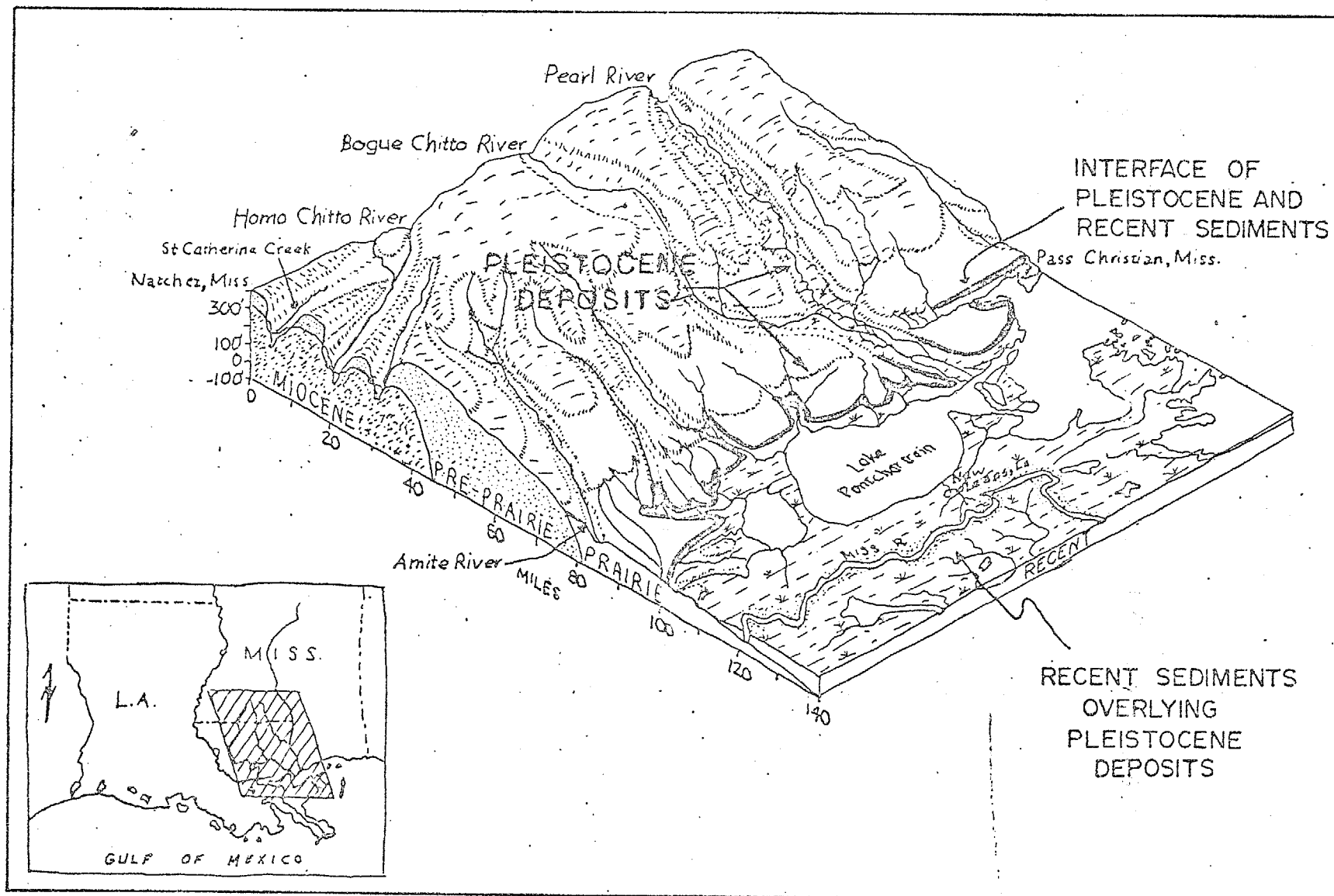




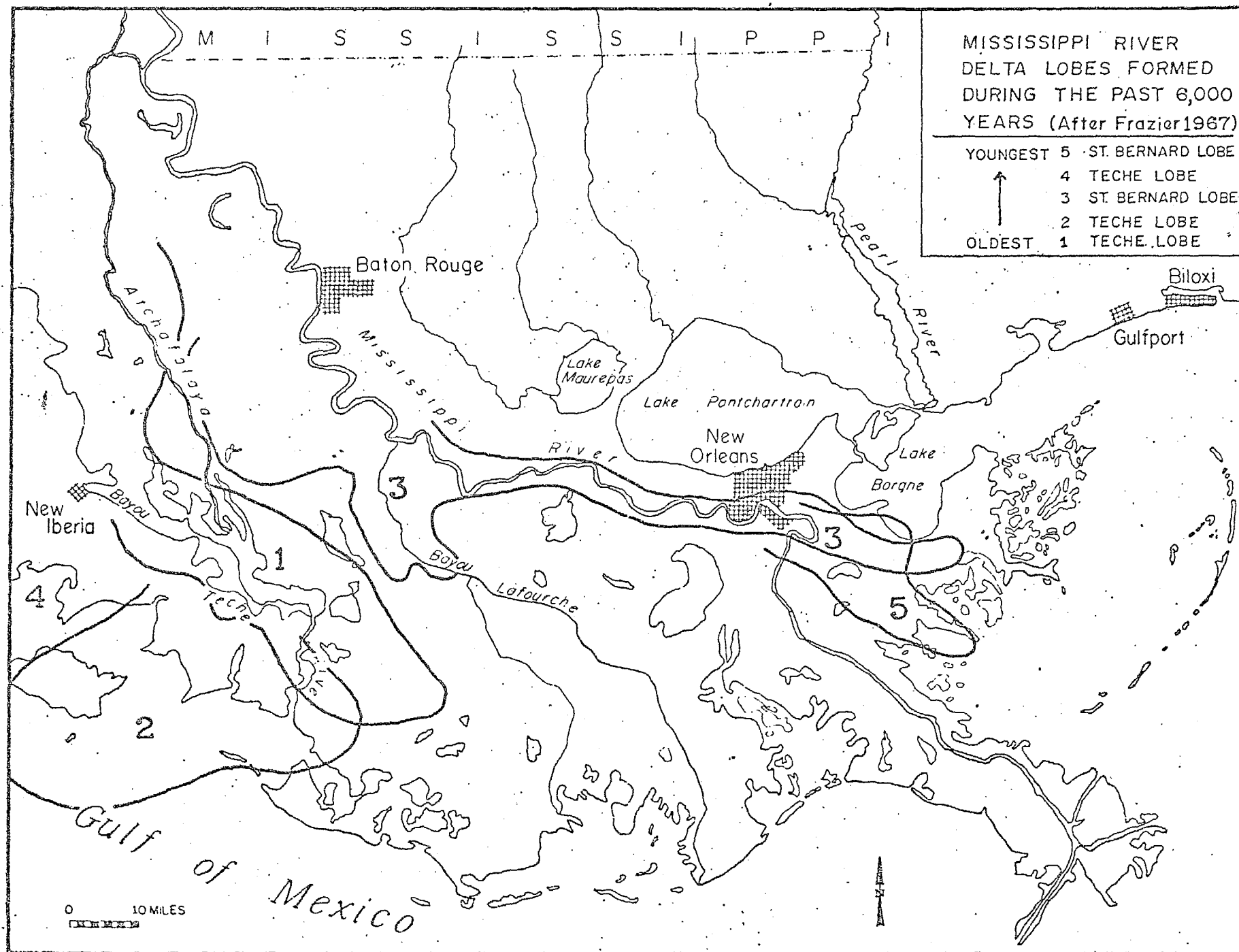
PROGRESSIVE POSITION OF THE 50 PERCENT LAND-WATER ISOPLETH IN THE DELTAIC PLAIN OF THE MISSISSIPPI RIVER SHOWING HISTORIC AND PROJECTED DETEORISTION. (FROM GAGLIANO, ET.AL., 1970)

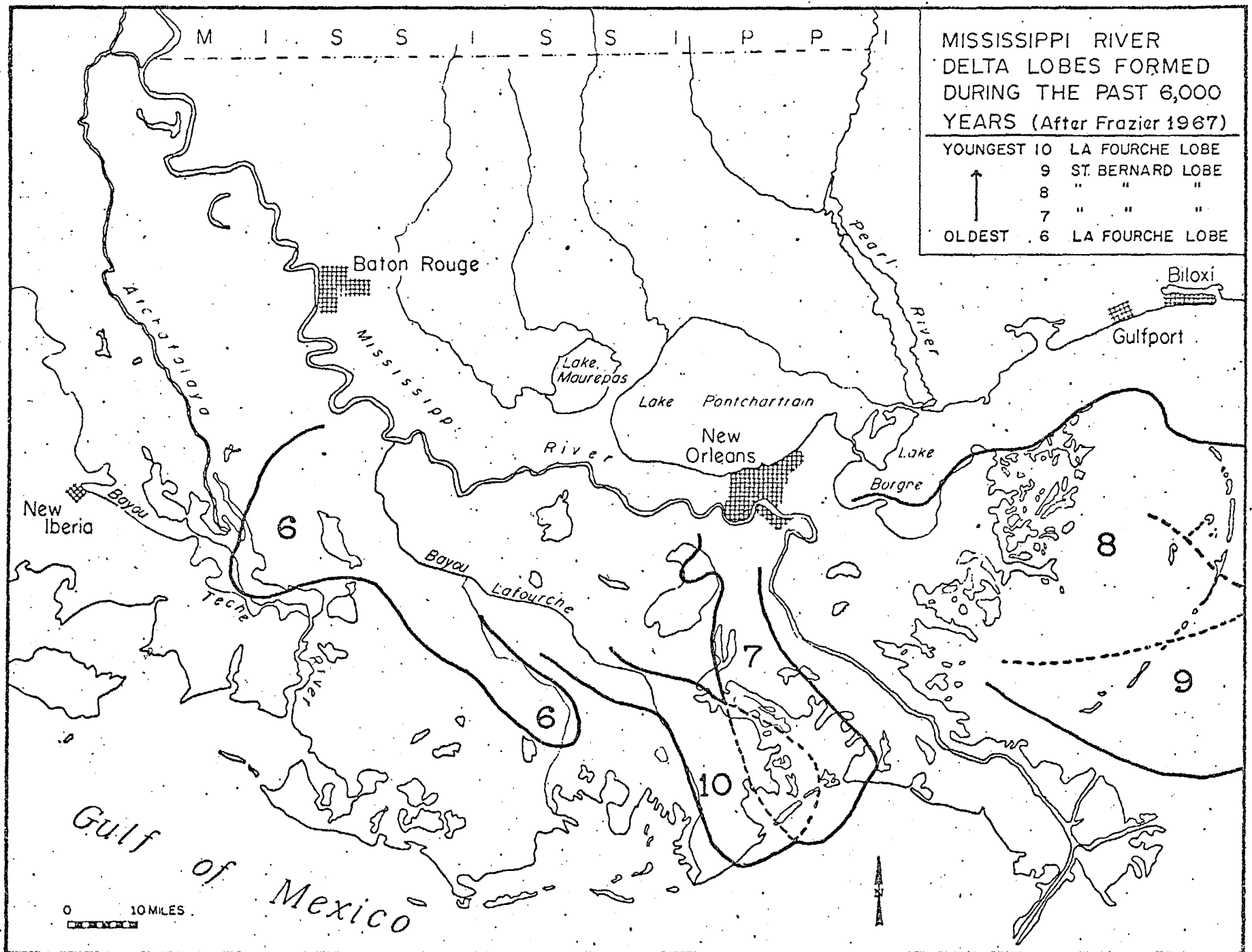


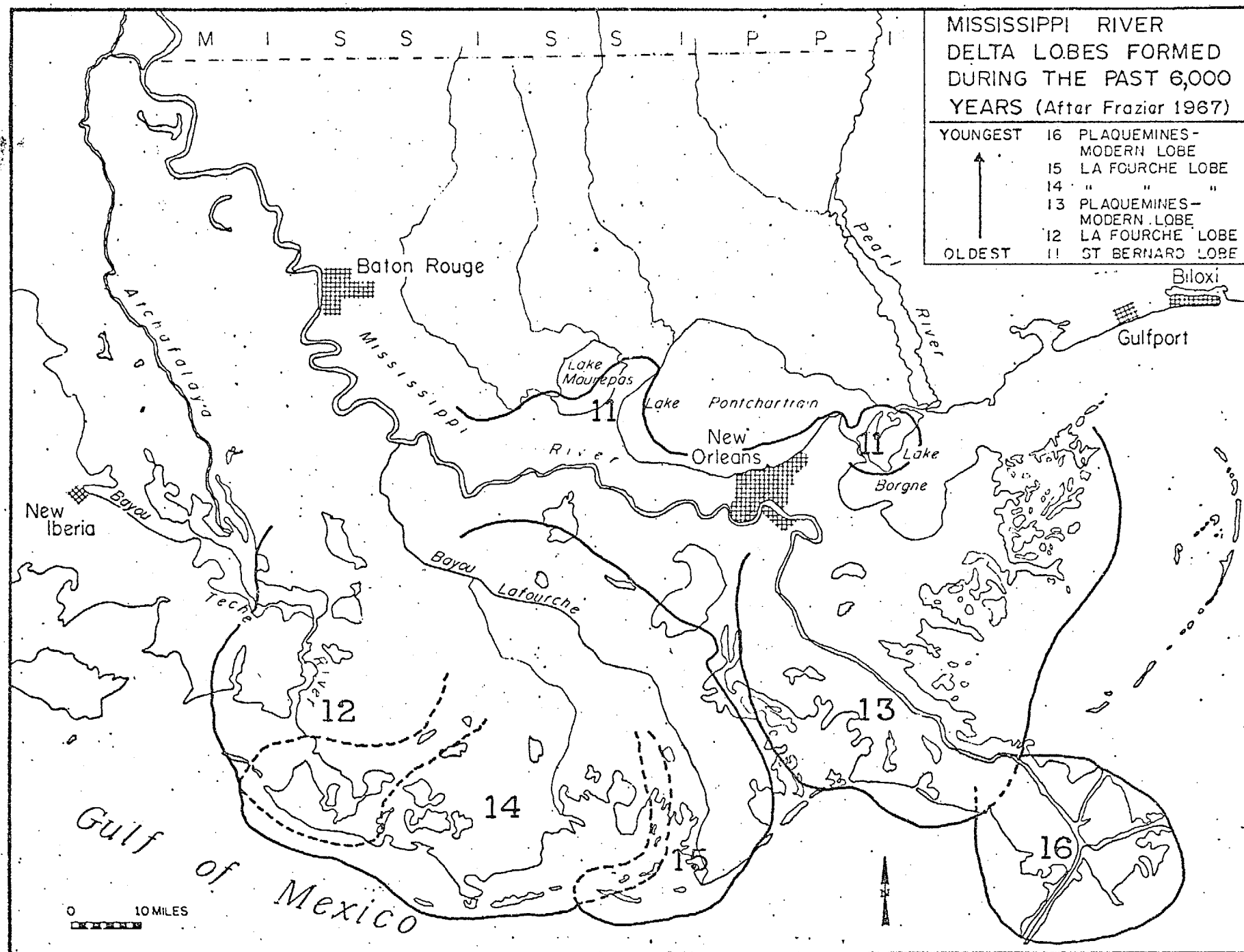


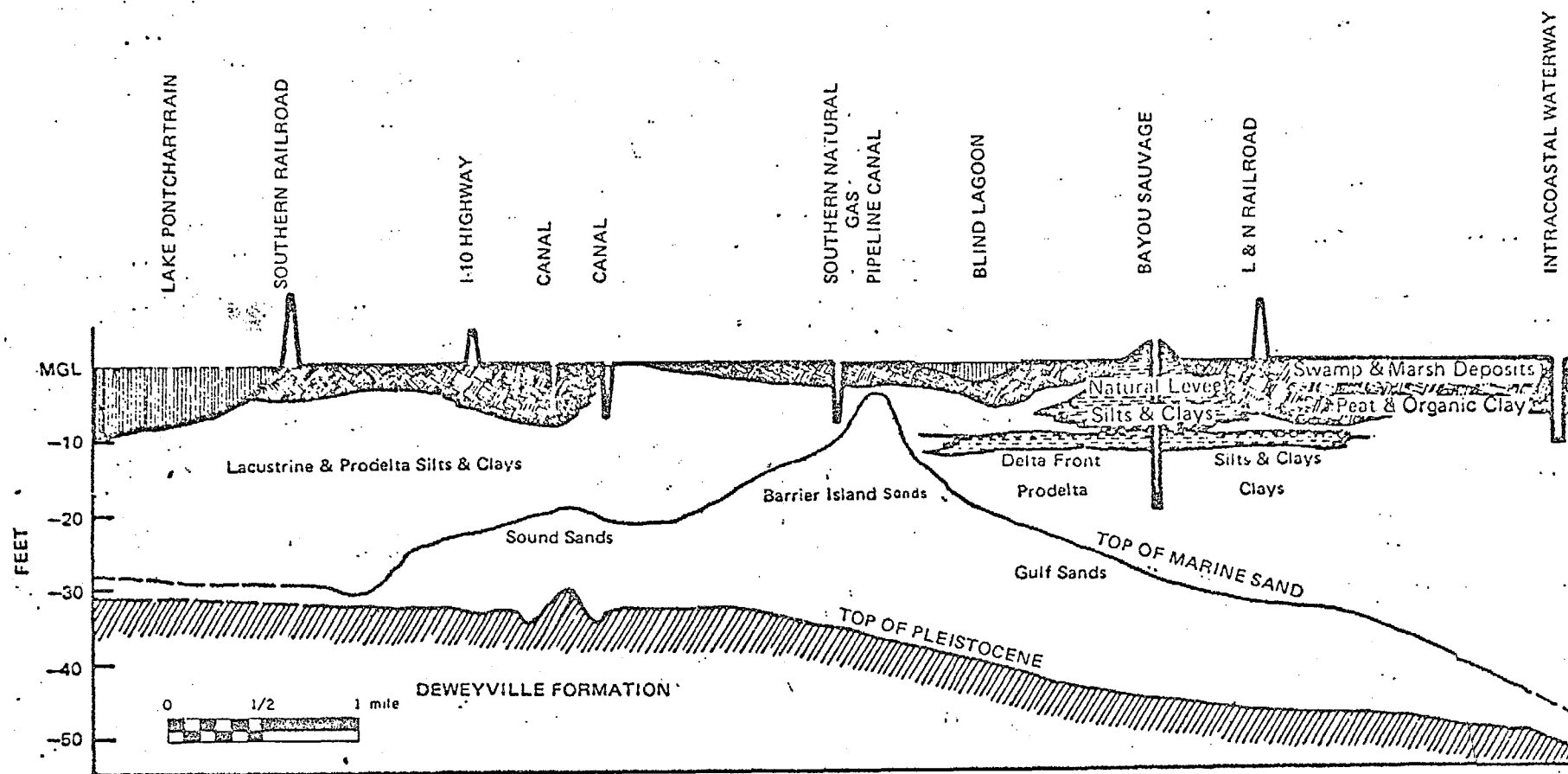


AERIAL SEDIMENTATION SEQUENCE (From Coastal Environments, Inc. 1972)









North - South Cross Section Through
The New Orleans East Area Showing
Near Surface Stratigraphy
(From Wallace, et. al. 1973a)

VIII 1720-A.D. - Present

- A. European culture established
- B. City of New Orleans plans new city "Pontchartrain New Town"

3
Current Environmental Conditions

Meteorology

New Orleans is located in a subtropical latitude having mild winters and hot, humid summers. During the summer prevailing southerly winds produce conditions favorable for afternoon thunder-showers. In the colder seasons, the area is subject to frontal movements which produce squalls and sudden temperature drops. River fogs are prevalent in the winter and spring when the temperature of the Mississippi River is somewhat colder than the air temperature.

A fairly definite rainy period occurs from mid-December to mid-March. Measurable precipitation occurs on about one-third of the days, periodically, to the north of a warm front or a cold front which has stalled over the northern Gulf of Mexico. Snowfall amounts are generally small, with the snow usually melting as it falls. Snowfalls of 2 inches or more occurred in January, 1881, February 1895 and 1899 and December, 1963.

The pattern of spring rains is similar to that of winter, while fall rains are distributed in much the same manner as summer rains. April, May, October, and November are generally dry, but there have been some extremely heavy showers in those months. The greatest 24-hour amount of precipitation since 1871 was 14.01 inches on April 15-16, 1927, while 13.68 inches fell on October 1-2, 1937. The heaviest recorded rate of rainfall in the New Orleans area was 1 inch in 5 minutes measured at the Post Office Building during a thunderstorm on February 5, 1955; however, such a rate is never long sustained. In contrast, one can expect a period of 3 consecutive weeks without measurable rainfall, on the average, about once in 10 years. The longest such period was 53 days from September 29 to November 20, 1924.

While thunder usually accompanies summer showers, thunderstorms with damaging winds are relatively infrequent. The most damaging thunderstorms are those which move over the City from Lake Pontchartrain, usually in connection with cold fronts and line squalls. Hail of a damaging nature seldom occurs, and tornadoes are extremely rare. Since 1900 the center of three hurricanes have passed over the city. The area has been affected by several others and also by a number of tropical storms which did not attain hurricane intensity. New Orleans is in the belt where a mean recurrence interval of fifty years gives an extreme wind with a speed of 95 to 100 m. p. h. or more. On September 19, 1947, (before the Weather Bureau started naming hurricanes), the highest wind officially measured at the airport was 98 m. p. h. at 9:12 a. m. from the north; afterwards, and shortly before the eye of the hurricane passed over the station, the velocity indicator became indistinguishable, but the wind was estimated to have reached

as high as 110 m. p. h. with gusts estimated to 125 m. p. h. Approximately 3 feet of water covered the airport and caused the field to remain closed for 28 days. In 1965, hurricane Betsy brought destructive winds to the New Orleans metropolitan area and over 50 deaths from drowning. On September 9, 1965, at 11:45 p. m. the winds at New Orleans International Airport reached 85 m. p. h. from the east, with gusts up to 112 m. p. h. In New Orleans, an extreme wind of 125 m. p. h. from the east was estimated from atop the Federal Building.

The lower Mississippi River floods result from runoff upstream. Rainfall within the State of Louisiana has little influence on these stages. The levees at New Orleans have not been overtopped in more than 100 years. If the water level in the river becomes dangerously high, the Bonnet Carre Spillway, some 33 miles above the city, may be opened to divert the floodwaters.

Southeast to southwesterly winds carry inland warm, moist air favorable for sporadic, often localized, development of thunderstorms. In the New Orleans area, these showers tend to occur most frequently around 1-2 p. m., and keep the temperature from rising much above 90°F. At times, a thunderstorm will develop over Lake Pontchartrain in the early evening, and move over the city. Occasionally, the pressure distribution changes to bring in a flow of hotter and drier air. However, there is only an average of about 7 days per year when the temperature rises to 95° or higher, while 102°F is the warmest, occurring most recently, June 30, 1954, in Orleans Parish. The longest period in New Orleans with temperatures of 90° or higher each day was 64 days, June 21-August 23, 1917, but the temperature did not exceed 96°F. The warmest summer was 1951, when the temperature for June, July and August averaged 84.7°F., but the temperature did not exceed 99°F.

From about mid-November to mid-March, the area is subjected alternately to tropical air and cold continental air in periods of varying length. About 80 percent of the December-February hourly temperatures range from 41° to 69°. The mean date of the first occurrence of 32°F, or lower is about December 12, while the mean date of the last occurrence is about February 12. Between those dates, there is, on the average, more than 6 days out of 7 entirely above freezing, with some afternoons having temperatures in the seventies and eighties. The mean length of the freeze-free period is about 302 days. The latest freeze date in Spring was March 27, 1955, with 30°F reported at the airport and Audubon Park. The earliest freeze date in the fall was November 11, 1894, with 32°F observed at Audubon Park. The usual track of winterstorms is to the north of New Orleans, but occasionally

Table 3

Rainfall At New Orleans (After U. S. Army Corps of Engineers).

Inches				Inches			
Month	Normal ¹	Max. ²	Min. ²	Month	Normal ¹	Max. ²	Min. ²
Jan	4.42	12.69	0.61	Jul	7.92	18.16	2.02
Feb	4.69	13.85	0.04	Aug	6.34	22.74	0.87
Mar	6.22	21.09	0.04	Sep	5.99	16.57	0.24
Apr	5.41	14.94	0.04	Oct	3.22	25.11	0.00
May	5.11	18.68	0.02	Nov	3.74	14.41	0.10
Jun	5.49	16.01	0.59	Dec	4.70	14.43	0.67

¹U.S. Weather Bureau normals 1931-1960²Based on records from 1870 through 1968

one moves into the area, bringing large and rather sudden drops in temperature, but the cold spells seldom last over 3 or 4 days. In about two-thirds of the years, one can expect the annual lowest temperature to be 24°F or warmer, with some years entirely above freezing. The lowest recorded temperature was 6°F on February 13, 1899, at Audubon Park. In New Orleans, the coldest winter was 1885-1886, when the temperature for December, January, and February averaged 50.9°F. From December to May, the water of the Mississippi River is usually colder than the air temperature, favoring the formation of river fogs, particularly with weak southerly winds. The nearby lakes also serve to modify the extremes of temperatures to increase fogginess over narrow strips along the shores.

From April through October, the occurrence of fog and/or low stratus clouds is not frequent enough for commercial aviation interest to ordinarily consider them operationally significant. In other months, particularly in winter, (December through February) the occurrences increase, with the greatest frequency in February. Based on 15 years of record less than 10 percent of the winter afternoon hours have visibilities under 3 miles and/or ceiling under 1,000 feet, but this increased to more than 20 percent in the late evening to mid-morning hours. In about half the winter hours, however, the relative humidity is under 80 percent, and values less than 50 percent are about twice as frequent as in the summer. Sunshine has an annual mean of about 60 percent of the possible, with monthly amounts varying from a winter low of near 50 percent to an October high in the lower seventies. Visibility at times is reduced by smoke from the industrial plants along the river. Smoke, particularly during the fall and winter, also occurs when marshland areas are burned.

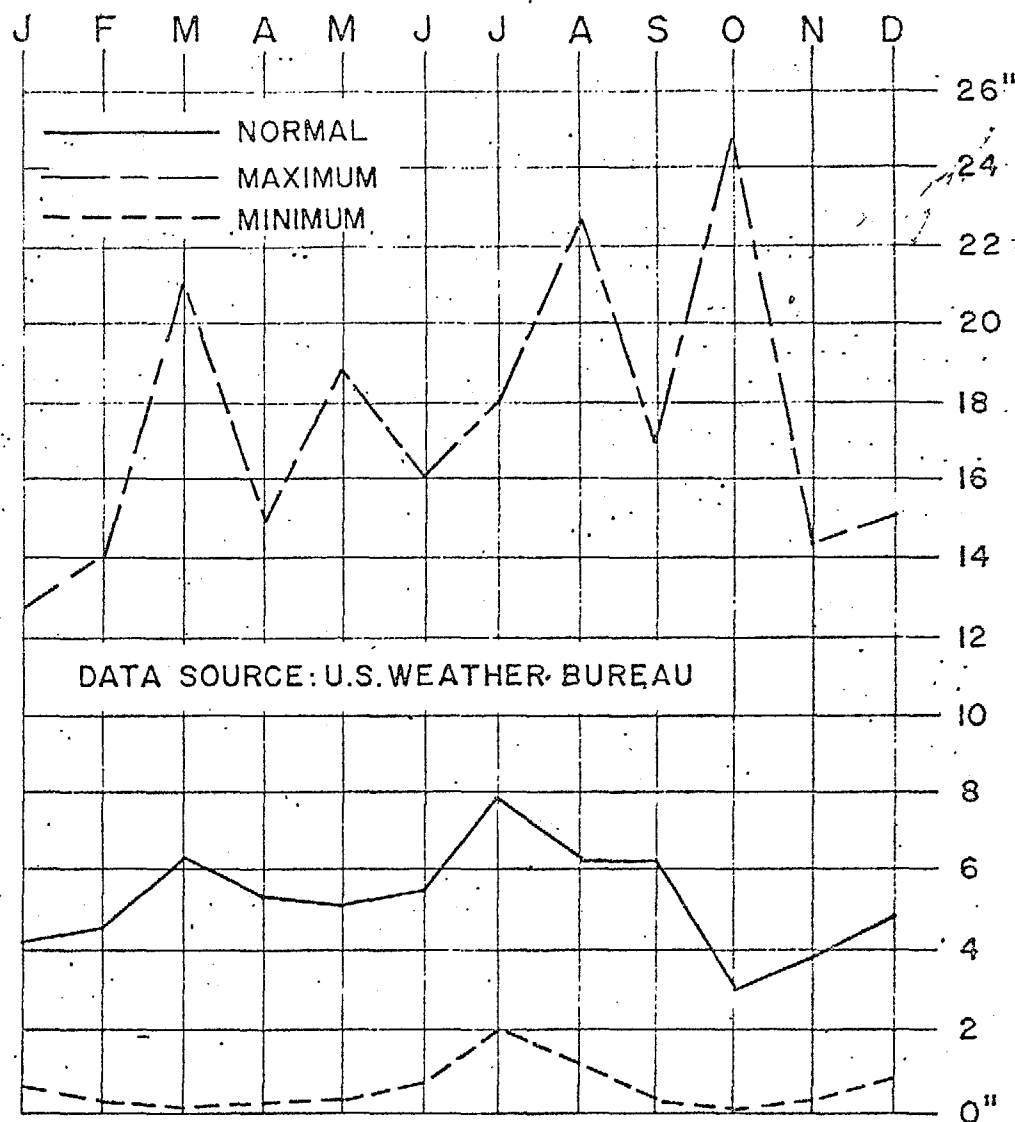
The climate of Orleans Parish and the northernmost part of Jefferson Parish is influenced, in a large degree, by the many surfaces provided by lakes and streams, and by the proximity to the Gulf of Mexico. Throughout the year, these water areas modify the relative humidity and temperature conditions, decreasing the range between the extremes; when southern winds prevail, these effects are increased, imparting the characteristics of a marine climate. Relative humidities of less than 50 percent occur in each month of the year; however, they are less frequent in the summer months than in other seasons. During mid-June to mid-September, the prevailing southeast to southwesterly winds carry inland warm, moist air favorable for sporadic, often quite localized, development of thundershowers. In the New Orleans area, these showers tend to occur most frequently around 1-2 p. m., and keep the temperature from rising much above 90°F. At times, thunderstorm will develop over Lake Pontchartrain in the early evening, and move

over the City. Occasionally the pressure distribution changes to bring in a flow of hotter and drier air. However, there is only an average of about 7 days per year when the temperature rises to 95° or higher, while 102°F is the warmest, occurring most recently, June 30, 1954, in Orleans Parish. The longest period in New Orleans with temperatures of 90° or higher each day was 64 days, June 21-August 23, 1917, but the temperature did not exceed 96°F. The warmest summer was 1951, when the temperature for June, July, and August averaged 84.7°F., but the temperature did not exceed 99°F.

Aside from the usual storms which occur throughout the year, the hurricanes of late summer and early fall are of particular interest because of their severity. Hurricanes are well developed cyclonic storms, usually of tropical origin. Hurricane characteristics are violent winds (greater than 74 miles per hour), tremendous waves and surges, and torrential rainfall. Size and duration vary with each hurricane but generally they extend over thousands of square miles, reach heights of 30,000 feet or more, and last from 9 to 12 days. The winds associated with hurricanes are light to moderate at the outer limits of the storm; at about 30 miles from the center they reach velocities of about 100 miles per hour with gusts as high as 150 miles per hour; and at the center they are relatively calm. This calm area, called the "eye" of the storm, ranges between 7 and 25 miles in diameter. Hurricanes strike the Louisiana coast an average of 2.5 times per year.

The hurricane surge which inundates low coastal lands is the most destructive of the hurricane characteristics. It alone accounts for three-fourths of the lives lost from hurricanes. It is the produce of meteorological, beach, and shore conditions. In the initial stage of development, it reaches a height of 3 feet in the open sea from the combined effects of high velocity wind and a lowered barometric pressure (lowest recorded was 26.33 inches). Simultaneously, at shore, the water levels slowly begin to rise. As the hurricane approaches and the surge develops under the influence of a gently rising ocean floor and a favorable or indented shore contour, the shoreline water level rises more rapidly. A higher surge will be produced if the hurricane pass is perpendicular to shore, the velocity of forward movement is slow, or the storm's diameter is very large. Maximum storm heights experienced along the Gulf coast range between 10 and 16 feet.

Recent hurricanes of interest were "Betsy" in 1965, and "Carla" in 1971. On September 9, "Betsy" crossed the Louisiana coastline near Grand Isle and proceeded inland west of the Mississippi River. It is estimated that the hurricane caused inundation of 4,800 square miles of land in Louisiana, the death of 81 persons,



CLIMATE ANALYSIS: PRECIPITATION

about one-quarter million persons to be evacuated and damages in excess of 350 million dollars. The floodwaters disrupted transportation, communications, and utility services for approximately one tenth. The area east of the Mississippi River was particularly heavily damaged by overflow when the surge overtopped and/or crevassed local levees. Tidal surges in Lake Borgne are estimated to have been 8 to 10 feet.

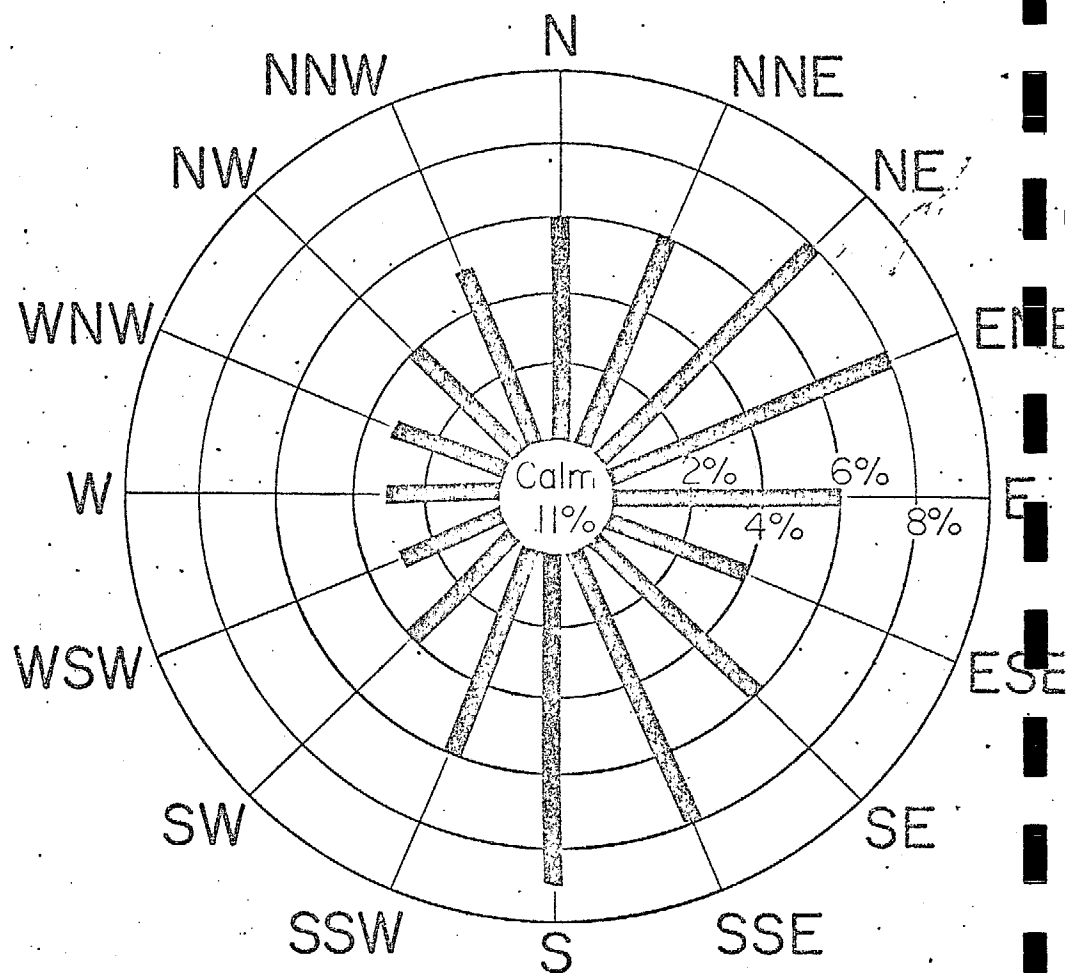
Hydrology

Lake Pontchartrain is a shallow (14 feet average depth) 640 square mile tidal basin bordered on its south side by the New Orleans Metropolitan locale. It is important to note that the lake is only a part of the total inter-related estuarine environmental complex of this southeastern Louisiana coastal area.

The water level in Lake Pontchartrain is subject to variations from direct rainfall, tributary inflow from its 4,446 square mile drainage basin, wind driven water movements, translated movements through many channels and tidal variations originating in the Gulf of Mexico. Likewise, Lake Borgne is subject to water level fluctuations due to wind driven water movements and tidal variations originating in the Gulf of Mexico. Marsh floods result from heavy rainfall which ponds in numerous lakes and inland bays. These floods tend to freshen the brackish and salt-marsh for short periods. Marshes are reverted to a completely saline environment by occasional tidal overflow. The area is protected from major fresh water flooding by mainline levees along the Mississippi River.

The channels which accommodate the translation of water to and from Lake Pontchartrain are the Chef Menteur and Rigolets natural passes, the Mississippi River-Gulf Outlet, and the Gulf Intracoastal Waterway-Inner Harbor Navigation Canal. The combination of flows through these channels determine the salinity regimen in the lake. The deep channel of the Mississippi River-Gulf Outlet serves as an avenue of salt water-intrusion into Lake Pontchartrain.

Drainage from most of Louisiana east of the Mississippi River is accomplished by relatively small streams which flow generally southward into the basin from the uplands on the north. At present the only water from the Mississippi River received by the basin is that discharged occasionally in Lake Pontchartrain through Bonnet Carre spillway and the Industrial Canal. The alluvial ridges drain down-slope into the adjacent marsh or swamplands which, under natural conditions, are under-drained. In the reclaimed areas of the marsh and swamplands protection levees have been constructed and drainage is accomplished by



Mean Wind Velocity 8.5 mph

DATA SOURCE: U.S. WEATHER BUREAU

Table 4 .

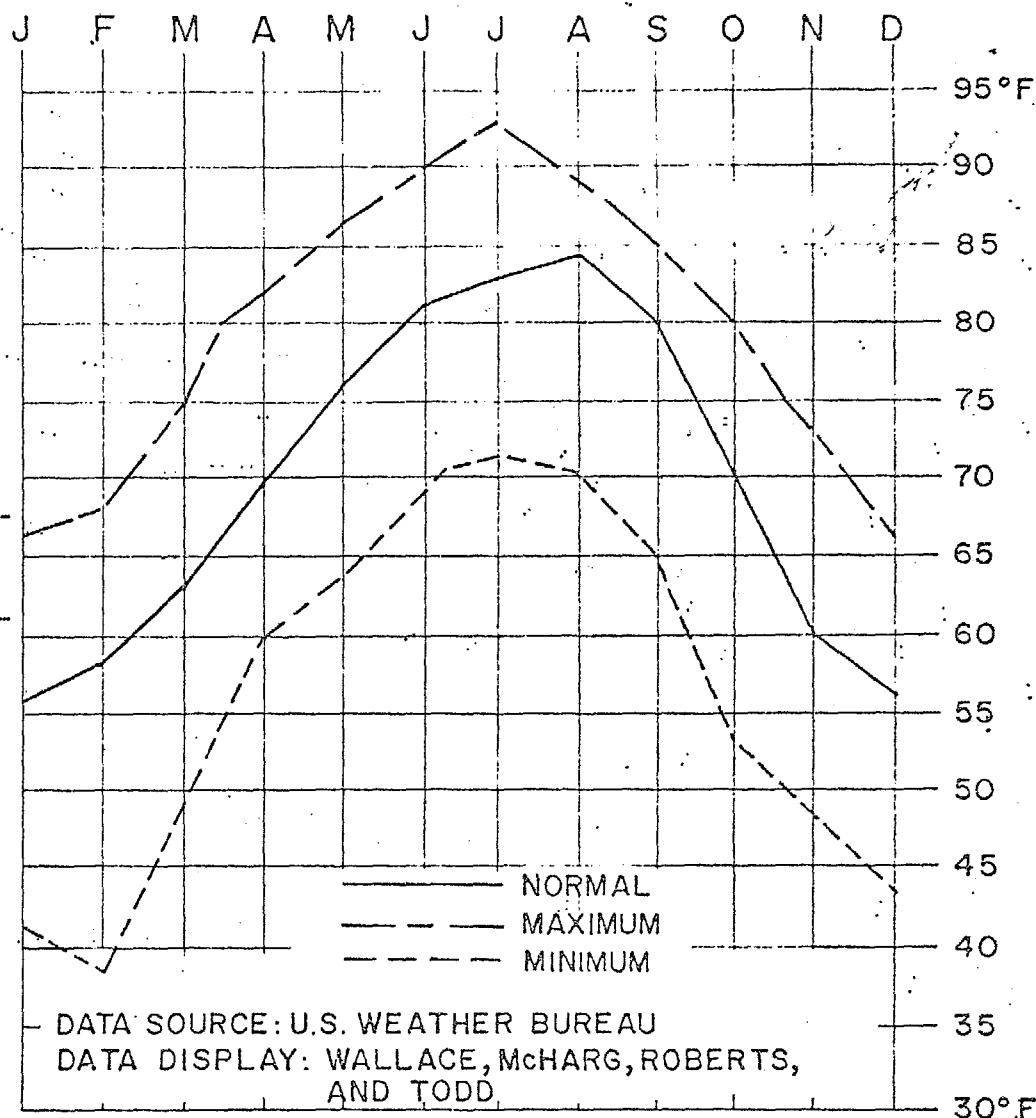
Temperature At New Orleans (After U.S.
Army Corps of Engineers, 1969)

Degrees Fahrenheit				Degrees Fahrenheit			
Month	Normal	Max.	Min.	Month	Normal	Max.	Min.
Jan	56.0	67.2	41.2	Jul	83.4	91.7	71.5
Feb	58.2	67.2	38.6	Aug	83.5	89.9	70.3
Mar	62.8	75.3	48.1	Sep	80.2	86.2	66.0
Apr	69.7	83.0	60.4	Oct	72.6	80.0	52.6
May	76.8	85.5	63.8	Nov	62.0	76.7	48.1
Jun	82.3	91.1	69.2	Dec	56.1	66.6	46.4

Extreme minimum 7° F., 13 February 1899

Extreme maximum 102° F., 30 June 1954 (also earlier dates)

+This section was derived largely from Gagliano et al, 1972,
except for the subsection entitled "Biological Conditions".



CLIMATE ANALYSIS: TEMPERATURE

large pumps that generally discharge into canals that connect with the lakes.

Precipitation data indicate that average precipitation for the entire state of Louisiana is greater than for any other state. The water balance analysis for the years 1945 through 1968 suggests a quite regularly recurring pattern of deficit and surplus gradients with the state; through time, however, there is somewhat of a "feast" or "famine" schedule of deficits and surpluses. Despite the high rainfall, deficits occur frequently with magnitudes large enough to produce serious ecological and economic consequences. Regularly recurring surpluses are restricted to winter and spring months, but within these seasons there is a very large variation among years. Surplus precipitation is defined as that which is not used for evapotranspiration or soil moisture recharge.

The average winter-spring (December through May) surplus for the period 1945-1968 was 18.4 inches, while the average summer-autumn (June through November) surplus was 5.0 inches. In spite of these surpluses however, an average seasonal precipitation deficit of 3.1 inches is recorded throughout the growing season. Seasonal deficit is the summation of each monthly deficit throughout the growing season from February through November. Excess precipitation (surplus) can be expressed as runoff.

Aquifers (Wallace, et. al, 1973a) in the New Orleans area occur at subsurface depths of 100, 400, 700, and 1200 feet. The principal aquifer in the area is the 700 foot sand. In 1963 the average daily with-drawal from this sand was 51.2 million gallons and it is estimated that by 1980 withdrawals will reach 90 mgd (million gallons per day). Water levels in the center of the core of depression resulting from the current with-drawal are about 140 feet below the pre 1900 level and the projected increase in with-drawal rate should cause an additional water level decline of about 100 feet by 1980. Salt water intrusion is not deemed serious, provided the current distribution of pumping is maintained. Wells yielding 1000 gpm (gallons per minute) or more can be constructed anywhere within the New Orleans area. In the northern part of the area the "700-foot" sand yields fresh, soft water that is low in iron but has a distinct yellow color. This color, due to organic matter, is not harmful but makes the water undesirable for several uses, including public supply, unless the color is removed by treatment.

In the area along Bayou La Loutre shallow sands underlying an old distributary channel are the only source of fresh water, which is very hard and has a high iron content.

The "200-Foot" sand is a poorly definable aquifer, which thickens and thins and pinches out abruptly. It presently supplies only about two percent of the withdrawals in the project area. In the northwest corner of Jefferson Parish the water in the "200-Foot" sand is fresh; throughout the rest of the area water in this sand generally contains about 500 to 900 ppm (parts per million) of chloride. Additional supplies of ground water can be obtained from the "200-Foot" sand for use where quality is not important.

The "400-Foot" sand underlies Jefferson Parish and the northwestern part of Orleans Parish but pinches out in Eastern New Orleans. West of the pinchout the aquifer thickens abruptly and is a potential source of large quantities of brackish water (chloride content, 250 to 500 ppm). Only in northwestern Jefferson Parish is the water in this aquifer suitable for public supply. Few wells tap the aquifer in the New Orleans area, but one well completed recently is reported to have yielded 2,500 gpm.

No wells in the New Orleans area yield fresh water from the "1,200-Foot" sand; however, available data indicate that it contains fresh water throughout its entire thickness in the vicinity of Irish Bayou. In downtown New Orleans the aquifer is thin and shale, but to the northeast it thickens considerably.

In the northwest corner of Jefferson Parish both the "200-Foot" and "400-Foot" sands contain fresh water and are virtually untapped. Before extensive development is considered it must be realized that such action would probably cause the northward movement of more highly mineralized water. In almost all the western half of the New Orleans area moderate to large quantities of slightly to moderately saline water could be pumped from these sands. If water quality is not critical, use of the "200-Foot" and "400-Foot" sands rather than the "700-Foot" sand would be beneficial, because it would reduce the water demand being made on the "700-Foot" sand.

The "1,200-Foot" sand is thickest in the eastern half of the New Orleans area and will probably yield large quantities of saline water through most of the northeastern Orleans Parish. Fresh water occurs at the latitude of Irish Bayou and northward.

Water levels in the "200-Foot", "400-Foot", and "1,200-Foot" sands are generally within 20 feet of the land surface. The only exception of consequence is the "400-Foot" sand in western Jefferson Parish, where water levels as low as 30 feet below the land surface may result from the industrial pumping at Norco in St. Charles Parish. The stage of the Mississippi River has a definite effect on the "200-Foot" sand water levels. A high river stage will cause wells in this sand to flow.

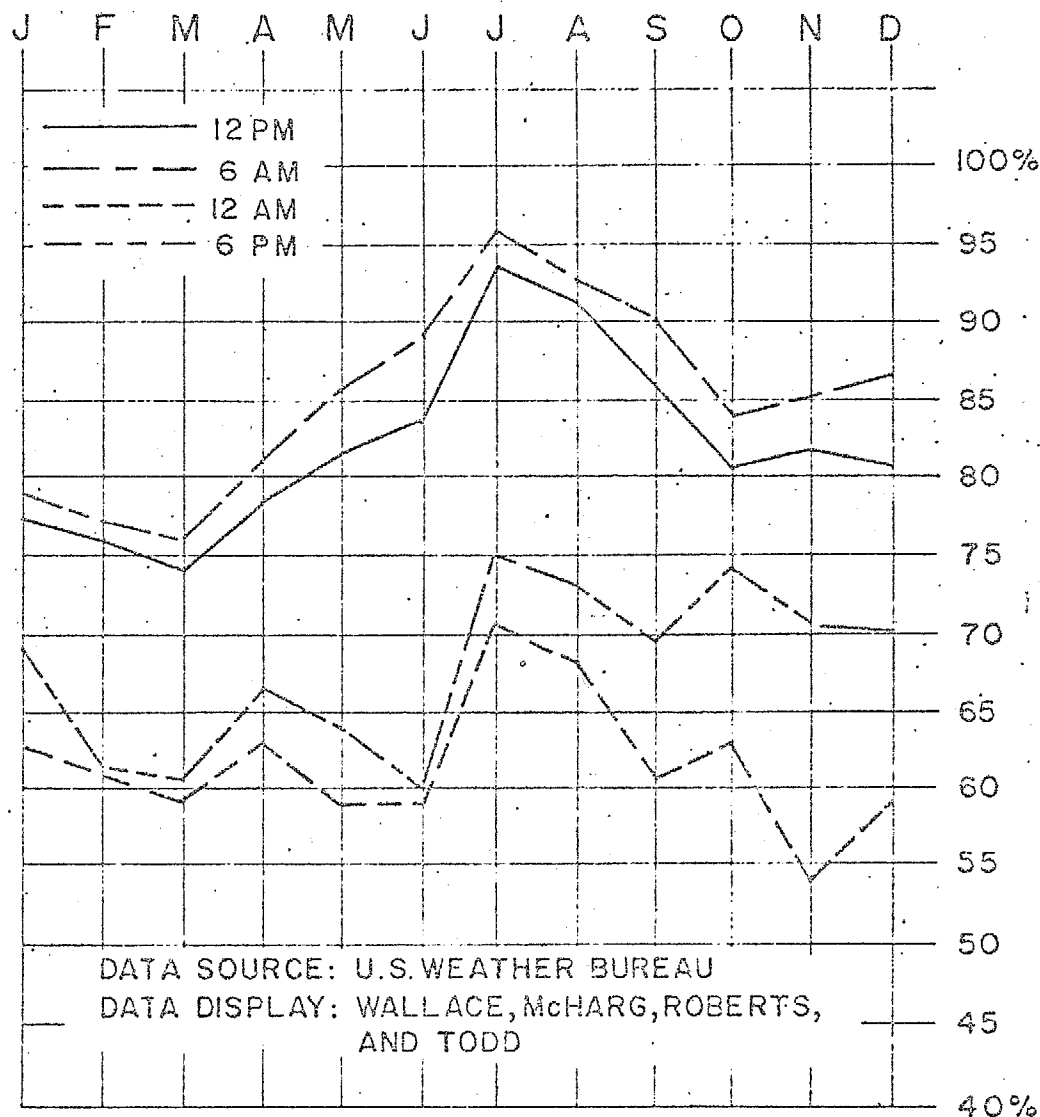
The "700-Foot" sand is the principal source of ground water in the New Orleans area. In 1963 more than 90 percent of all ground water used in the area was pumped from this sand. The 1963 withdrawals of 51 mgd are expected to increase to about 90 mgd by 1980. As a result, water levels will continue to decline from their present low of about 130 feet below mean sea level to an estimated low of about 250 feet below mean sea level in 1980. Some northward movement of salt water has occurred; however, at the present time (1963) wells along the interface between fresh and salty water have created a "protective pumping" barrier to the northward advance of the salty water. As long as the wells along the interface continue to pump at an adequate rate, the danger of salt water contamination in the area north of the interface is minimized.

At present nearly all of the drinking water for the New Orleans area is purified Mississippi River water. A recent report from the local office of the Environmental Protection Agency confirms the presence of about 32 synthetic organic compounds in the New Orleans drinking water supply. Approximately half of the compounds are potential carcinogens (cancer-causing) and almost all are listed as hazardous to health. The effect of these industrial effluents on health is unknown.

The relatively untouched and extensive 1200 foot sand in the vicinity of Pontchartrain New Town and Irish Bayou could prove to be a valuable source of fresh water for human consumption. Use of this aquifer could reduce reliance on New Orleans city water supply.

Preliminary intensive studies from November 1968 to July 1969 showed that the discharge of storm water into Lake Pontchartrain affects the water quality and bio-rhythm of aquatic micro-organisms. Especially after heavy rains in Orleans Parish, the presence of coliforms renders the nearshore water and beaches unsafe for some water sports. Storm drainage from Jefferson Parish also supplies coliforms that are transported to the New Orleans shoreline. Phosphates and nitrites nourish and bring about increases in phytoplankton and bacteria. Lake sediments, stirred up by wind waves and during heavy rains and by shell dredging activities, increase the turbidity; the reduced light available for photosynthesis results in the death of phytoplankton, which add to the bottom organic materials and subsequently furnish food for more planktonic growth, and thus hastens the filling of the lake.

The Orleans Sewerage and Water Board is attempting to minimize the affects of its runoff water on Lake Pontchartrain by chlorinating all storm water in the outfall canals. However, there are



CLIMATE ANALYSIS: HUMIDITY

indications that the treatment period is too short to allow full chlorination of the runoff during periods of heavy rain. However, EPA has determined that correcting the problem through sewer line replacement would not be financially feasible, and has advised against such an action.

The City of New Orleans faced possible court action from the State Board of Health for failure to meet the State's requirements of secondary treatment of all sewage. Failure by the City to adequately treat their sewage has resulted in high coliform counts in Lake Borgne and subsequent closing of the lake to all shell-fishing by the State Board of Health; the City has however, recently let a contract for the construction of a 122 million gallon per day secondary treatment facility which is expected to eliminate this problem. The large oyster industry in Lake Borgne has been damaged in the process. Portions of Lake Pontchartrain nearest Pontchartrain New Town have thus far remained unpolluted by coliform.

Oceanography

Under normal conditions, the tide in both Lakes Pontchartrain and Borgne is diurnal, Lakes Pontchartrain and Borgne have a tidal range of approximately six inches and one foot, respectively. The Rigolets and Chef Menteur Pass have developed naturally deep and wide channels having adequate capacity for normal tidal flows and for discharge of tributary flow. However, the frequent and often appreciable changes in the water level of Lake Pontchartrain are not primarily caused by periodic tidal variations. Nearly all changes are the result of variations, in the direction, force, and duration of the wind.

During the winter, when the wind is frequently from the north or northwest, lake levels may average one to two feet lower than during the summer. This is the result of a net movement of water from the lakes into the Gulf. Abrupt changes in wind direction, such as those which often accompany the passage of a cold front, may cause a rapid change in lake level. This effect is evident in winds as low as 5 miles per hour. Easterly winds cause a rise in Mississippi Sound and Lake Borgne, producing an increase in flow through the passes and a subsequent rise in the lake level. Westerly winds have the reverse effect. A rise or fall of six inches in an hour has been observed on the shore of Lake Pontchartrain on several occasions. The effects which hurricanes can have on water levels has already been pointed out. Strong winds and heavy rainfall which occasionally accompany conventional thunderstorms normally create localized turbulence but have little effect on overall lake levels.

As a result of frequently changing lake levels, strong and irregular currents often characterize the major passes, particularly the Rigolets. The ordinary maximum velocity in this pass is 0.6 knots but extreme velocities of 3.75 knots have been observed. Observations suggest that a slight counter-clockwise circulation may be present in Lake Pontchartrain. However, the currents are affected by the volume of fresh water inflow (estimated to average 5 million acre-feet annually), tides and storm surges which cause enormous volumes of water to pass in both directions, through the Rigolets, Chef Menteur Pass, Lake Borgne, Mississippi Sound, the Inner Harbor Navigational Canal, and the Mississippi River-Gulf Outlet. With so many variables operating on the several elements of the system, the current patterns are continually changing.

The salinity of Lake Pontchartrain averages less than six parts per thousand but varies widely with location and season. Least salinity occurs in the northwestern portion of the lake during the winter and spring months. Values as low as 1.2 parts per thousand (following a heavy January rainfall) and as high as 18.6 parts per thousand (following a September tropical storm) have been observed in the lake.

Salinity data collected at Little Woods indicate that long term fluctuations occur super-imposed on short term changes brought on by changes in rainfall. The salinity regime at Little Woods was relatively constant during the years 1952-1956 (the mean = 3000 ppm chloride) but changed during 1957 (mean = 2000 ppm chloride) to lower salinities for the period 1958-1961 (mean = ppm chloride). Another transition occurred in 1962 to higher salinities for the period 1963-1968 (mean = 4000 ppm chloride).

Within the time span of these long term changes, shorter term fluctuations are observed for wet and dry years. During the wet year of 1961 the computed average annual salinity was 1.4 ppt, while the dry year yielded salinities at Little Woods which averaged 6.4 ppt. The creation of the Mississippi River - Gulf Outlet has influenced the salinity regime of Lake Pontchartrain by introducing more saline waters into the lake via this new channel.

The salinities in Lake Borgne are generally higher than that of Lake Pontchartrain due to lesser fresh water flows and closer proximity to the Gulf of Mexico. Average yearly salinity in the wet year (1961) was 2.4 ppt, while in the dry year (1963) salinities averaged 11.1 ppt. These years represent the probable extremes of salinity.

Water temperature in Lake Pontchartrain and Lake Borgne are moderate and ice is rare. In Lake Pontchartrain average temperatures range from a high of 30 degrees C. in August to a low of 10.5 degrees C. in January. In Lake Borgne, average

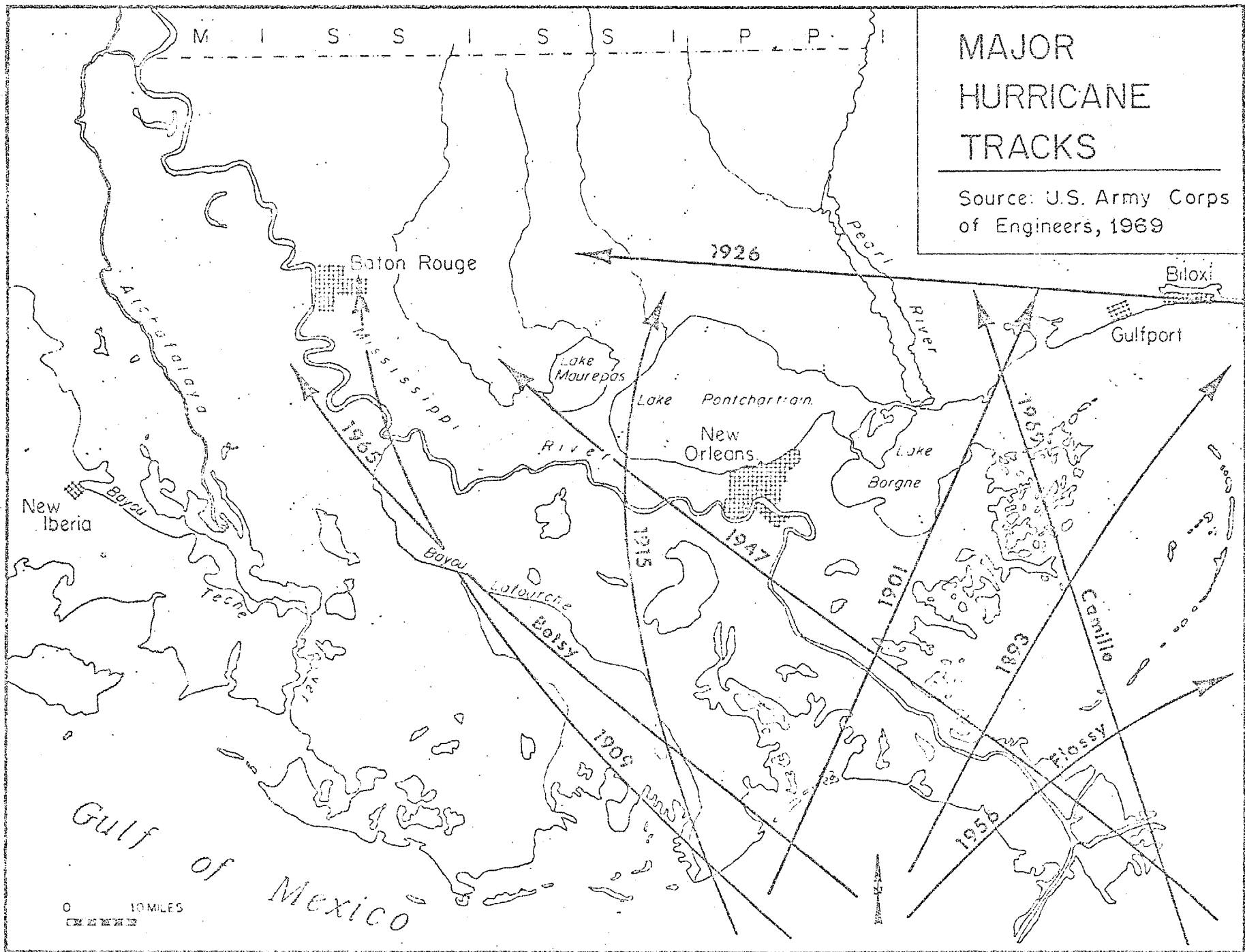


Table 5

Sampling Stations And Parameters Measured In Study Area
(After Barrett, 1971b)

Sta. No.	Location Name	Coordinates		Depth (ft.)	Type of Sample				
		N. Lat.	W. Long.		Salinity	Temperature	Oxygen	Turbidity	Chemistry
1.....	Unknown Pass.....	30°06'22"	89°41'32"	25	X	X	X	X	X
2.....	Geoghegan Canal.....	30°10'56"	89°43'08"	15	X	X	X	X	X
3.....	Marques Canal.....	30°05'06"	89°47'08"	15	X	X	X	X	X
8.....	Bayou Thomas.....	30°02'34"	89°49'18"	20	X	X	X	X	X
9.....	Bayou Bienvenue.....	29°59'26"	89°52'04"	15	X	X	X	X	X
18.....	Chef Menteur Pass.....	30°04'42"	89°47'40"	8	(X)	(X)*			

* the symbol (X) indicates measurement by a continuous recording meter

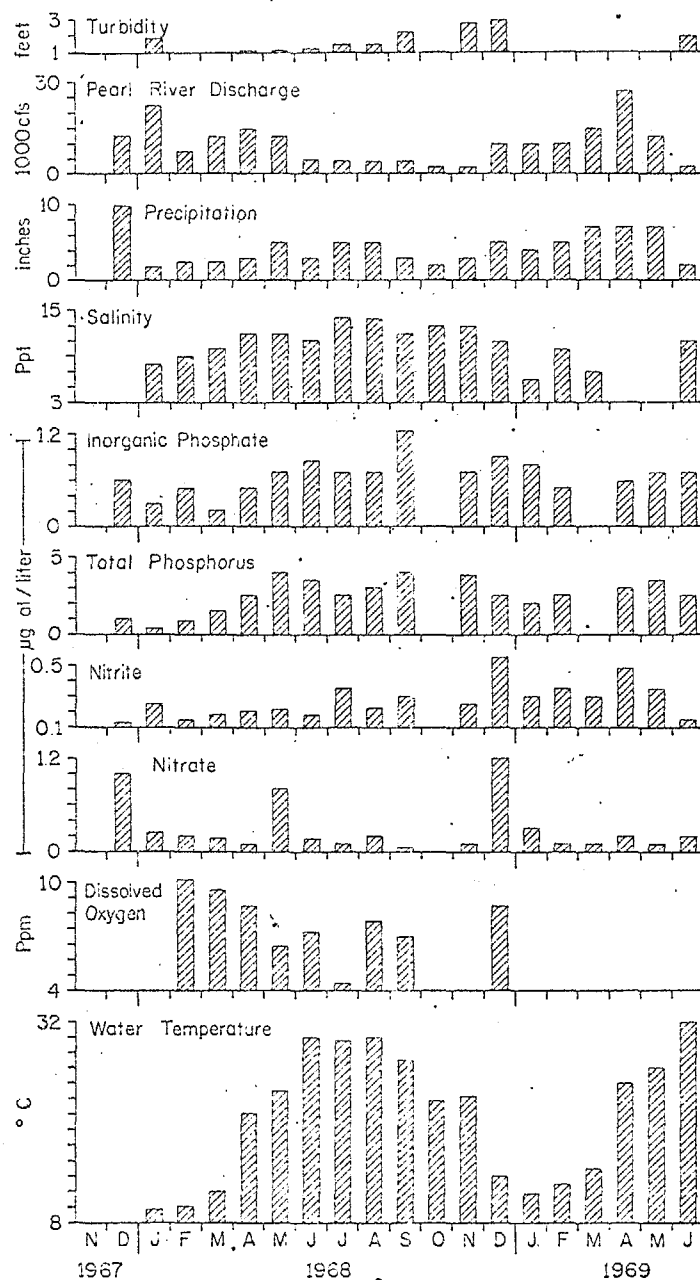
Table 6

Monthly Average Surface Water Temperature and
Salinity at Station 18 in Study Area

STATION 18
CHEF MENTEUR
PASS

Date	Water Temp (°C)		Sal (ppt)	
	1968	1969	1968	1969
Jan.....	9.3	10.1	1.8	5.2
Feb.....	10.1	12.4	3.8	6.2
March.....	13.8	12.4	6.4	5.8
April.....	22.1	21.4	6.2	4.0
May.....	25.0	25.2	5.4	3.0
June.....	29.6	29.1	5.1	4.3
July.....	29.8	30.9	6.0	5.5
August.....	29.9		4.3	
Sept.....	26.9		6.4	
Oct.....	23.6		6.6	
Nov.....	15.4	15.5	6.8	
Dec.....	9.3		5.8	10.1
Ann. Avg.	20.04	-	5.4	-

(from Barrett, 1971b)



Hydrological Parameters in Study Area

(After Barrett, 1971 b)

Table 7.

Hydrological Data And Meterological Conditions At Time Of Sampling For Stations 1, 2, 3, 8 and 9

STATION 1—UNKNOWN PASS																
Yr	Mo	Day	Water Temp. (°C)	Sal (ppt)	O ₂ (ppm)	NO ₃	NO ₂	PO ₄	Total P	Turbid (ft.)	Wind		Sea State (ft.)	% Cloud Cover	Tide	
											Dir	Vel (knots)			Water Level (ft.)	Stage
67	12															
68	1	9	8.7	4.0		3.70	0.20	0.20	0.35	1.2	NNE	5-15				Rising
68	2	9	12.3	3.7	9.7	3.17	0.22	0.45	0.96					20		
68	3	6	12.6	6.4	9.2	2.30	0.23	0.23	1.06					50		
68	4	2	21.2	4.8	8.8	1.17	0.15	0.22	1.43	2.0				100		
68	5	17	27.9	6.1	7.0	2.74	0.05	0.44	1.74	1.2	SSE	4-6	Calm	90	0.6	High Rising
68	6	20	30.3	6.1	9.0	0.50	0.03	0.31	1.53	1.0	NE	1-3	0.1-0.5	100		
68	7	17	29.3	9.2		0.00	0.07	0.34	1.37	1.5	SE	7-10	Calm	75		
68	8	5	31.0	12.2	6.9	1.08	0.50	0.56	2.54	1.5	SE	17-21	Calm	90		
68	9	4				0.00	0.11	0.63	2.77		SE	1-3	Calm	90	0.0	High Falling
68	10															
68	11	7	21.0	9.3		0.02	0.26	0.61	1.14	5.0	NE	4-6	Calm	0		Low Rising
68	12	13	12.9	7.4	8.9	14.53	0.24	0.36	1.36	2.5			Calm	100		Low Rising
69	1					3.69	0.27	0.37	0.94							
69	2					0.02	0.20	0.29	1.38							
69	3						0.19									
69	4					1.29	0.19	0.34	1.78							
69	5					1.09	0.11	1.28	3.71							
69	6	13	29.1	3.5		2.62	0.03	0.60	1.74	2.0	NNE	1-3	Calm	25		Falling
STATION 2—GEOCHEGAN CANAL																
67	12															
68	1	10	9.9	3.6		2.68	0.32	0.10	0.32	1.5	NNE	5-15		20		Falling
68	2	9	12.7	4.1	10.3	1.03	0.16	0.31	0.66					20		Falling
68	3	5	10.7	4.6	9.3	2.30	0.17	0.16	1.38					100		Falling
68	4	2	19.7	4.1	9.0	1.17	0.11	0.31	1.70	1.5				100		
68	5	17	28.8	6.3	8.0	2.30	0.15	0.49	6.62	1.0	SSE	4-6	Calm	90	0.0	High Rising
68	6	20	30.3	4.7	11.0	0.56	0.01	0.57	2.75	1.0	NE	1-3	0.1-0.5	100		
68	7	17	30.0	9.4		0.00	0.09	0.29	1.00	1.0	SE	7-10	Calm	75		
68	8	6				0.53	0.11	0.47	2.07	2.0			Calm	90		
68	9	4				0.00	0.03	0.53	2.23		SSE	4-6	Calm	60	0.8	High Rising
68	10															
68	11	17	22.3	11.1		0.42	0.12	0.52	2.04	5.0	NE	4-6	Calm	0		Low Rising
68	12	13	13.2	7.4	9.3	9.01	0.18	0.34	1.15	3.0			Calm	100		Low Rising
69	1					2.54	0.23	0.37	1.29							
69	2					0.95	0.14	0.27	2.39							
69	3						0.12									
69	4					1.46	0.34	0.34	4.22							
69	5							1.23	3.89							
69	6	13	28.7	4.4		1.98	0.04	0.51	1.74	1.5	NNE	4-6	Calm	25		Falling
STATION 3—MARQUES CANAL																
Yr	Mo	Day	Water Temp. (°C)	Sal (ppt)	O ₂ (ppm)	NO ₃	NO ₂	PO ₄	Total P	Turbid (ft.)	Wind		Sea State (ft.)	% Cloud Cover	Tide	
											Dir	Vel (knots)			Water Level (ft.)	Stage
67	12															
68	1	10	9.8	4.2		1.56	0.25	0.14	0.30	1.5	NNE	5-15				Falling
68	2	9	12.6	3.5	10.0	0.50	0.12	0.30	1.21					20		Falling
68	3	5	11.0	5.5	9.0	2.22	0.13	0.13	1.28					100		Falling
68	4	2	21.8	6.4	8.6	0.65	0.08	0.64	2.53	1.5				100		
68	5	17	27.9	6.3	7.3	1.25	0.05	1.44	3.92	0.8	SSE	4-6	Calm	90	0.5	High Rising
68	6	20	30.8	4.8	11.5	0.55	0.01	0.44	2.04	1.5	NE	1-3	0.1-0.5	100		
68	7	17	29.9	7.3		0.00	0.37	0.49	2.65	2.0	SE	7-10	Calm	75		
68	8	5	30.0	10.0	6.5	0.73	0.50	0.67	2.26	2.0	SE	17-21	Calm	90		
68	9	4	29.0	10.0	7.1	0.00	0.11	0.53	2.34	2.0	SE	1-3	Calm	60	0.8	High Rising
68	10															
68	11	7	20.6	8.9		0.43	0.13	0.44	1.80	3.0	NE	4-6	Calm	0		Low Rising
68	12	13	13.3	8.7	8.0	10.31	0.26	0.58	1.23	2.5			Calm	100		Mid Rising
69	1					1.56	0.24	1.62	2.58							
69	2					0.17	0.12	0.66	1.69							
69	3						0.19									
69	4					0.00	0.15	0.29	1.69							
69	5					1.67	0.53	0.40	2.53							
69	6	13	20.3	3.2		1.23	0.07	0.71	2.20	1.5	NNE	4-6	Calm	25		

Table 7 continued

STATION 8—BAYOU THOMAS															
67	12														
68	1	10	9.3	4.8		2.62	0.23	0.25	0.28	0.8	NNE	5-15			Falling
68	2	9	12.0	5.6	10.0	3.04	0.11	0.42	0.99				20		Falling
68	3	8	12.3	6.7	9.2	0.49	0.22	0.13	1.78				50		Falling
68	4	2	22.2	7.1	7.7	0.99	0.10	0.36	3.76	0.5			60		
68	5	17	27.7	6.4	7.5					0.8	SE	4-8	Calm	90	0.5 High Rising
68	6	19	30.5	7.5	7.0	6.39	1.12	1.73	5.34	2.0	SE	1-3	Calm	75	
68	7	17	29.6	8.0		0.89	2.82	0.91	2.30	1.0	SE	4-6	Calm	75	
68	8	5	31.2	10.2	8.5	-0.74	0.17	0.41	1.03	0.8	SE	17-21	0.1-0.5	90	
68	9	4									SE	7-10	Calm	90	0.7 High Falling
68	10														
68	11	7	22.1	8.8		1.65	1.15	0.75	2.63	1.5	NE	4-6	Calm		Mid Rising
68	12	13	12.9	9.2	7.8	7.42	0.20	0.68	1.34	3.0	W	4-6	0.1-0.5	100	Mid Rising
69	1					0.93	0.24		2.06						
69	2					0.00	0.21	0.83	1.11						
69	3						0.75								
69	4					1.57	0.99	0.29	1.74						
69	5					0.12	0.08	0.98	4.17						
69	6	13	30.0	5.3		1.53	0.05	0.76	1.96	1.6	NE	7-10	Calm	25	Mid Rising
STATION 9—BAYOU BIENVENUE															
Tide															
Yr	Mo	Day	Water Temp (°C)	Sal (ppt)	O ₂ (ppm)	NO ₂	NO ₃	PO ₄	Total P	Turbid (ft.)	Wind Dir	Wind Vel (knots)	Sea State (ft.)	% Cloud Cover	Water Level (ft.)
67	12														
68	1	10	11.5	6.2		6.70	0.55	1.05	0.79	2.0	NNE	5-15			Falling
68	2	9	13.1	9.1	12.5	5.76	0.21	0.68	1.38					20	Falling
68	3	8	12.9	15.3	9.7	1.09	0.23	0.39	1.32					50	Falling
68	4	2	21.2	9.9	8.3	2.34	0.58	1.14	3.17					75	Falling
68	5	17	28.0	7.1	7.4	6.08	0.43	0.54	3.74	2.0	SSE	4-6	Calm	90	0.4 High Rising
68	6	19	33.2	12.5	5.7	5.70	0.67	1.85	3.55	1.5	SE	1-3	0.1-0.5	75	
68	7	17	30.2	10.4				1.61	3.51	0.8	SE	4-6	Calm	75	
68	8	5	22.2	12.9	7.4	1.31	0.14	0.50	2.02	1.5	SE	17-21	Calm		
68	9	4				0.09	0.28	1.76	3.01		SE	0-1	Calm	100	0.5 Mid Falling
68	10														
68	11	7	22.4	10.3				0.62	0.14	0.5	NE	4-6	Calm	0	Mid Rising
68	12	13	14.1	9.2	5.8	6.18	0.28	1.15	2.00	2.5	W	4-6	0.1-0.5	100	Mid Rising
69	1					9.19	0.69	1.64	2.81						
69	2					0.03	0.36	0.16	2.35						
69	3						0.43								
69	4					3.88	0.05	1.47	3.33						
69	5					0.94	0.26	0.78	2.16						
69	6	13	30.8	9.7		1.22	0.13	0.09	2.77	2.1	NE	7-10	0.1-0.5	25	

(From Barrett, 1971b)

highs of 32 degrees C. in July and lows of 9 degrees C. in February are recorded.

Tables 5-6 depict data collected by Barrett (1971b) in studying Lake Borgne and vicinity. The data given are for six (6) Sampling Stations.

Biology

The physical characteristics of Louisiana, and especially of the environment of New Orleans, provide a remarkable setting for the City of New Orleans. There are large areas within the city limits which are sparsely settled and which abound with wildlife and where excellent game fishing may be pursued. And because of the close proximity of the marsh-lands to the city, markets are provided the fishing, oyster, fur and forestry industries.

There are seven million acres of marsh land within the proximity of New Orleans, connected by hundreds of lakes and water ways where fisheries, oyster beds, game and fur trapping exist.

The total gross acreage of the State of Louisiana Constitutes nineteen million, two hundred thousand acres. The city of New Orleans encompasses about 300 square miles, about 200 of which are in marsh and or water bottom.

The marsh lands or wetlands of coastal Louisiana surrounding New Orleans can be divided into fresh water marshes and salt water marshes, based upon the salinity of the soil water and the vegetation in general. The fresh water marshes border on cypress swamps, so that occasional bald cypress trees extend into the marsh which supports cattail, Roseau cane, Phragmites, arrow-head, pickerel weed, water millet, and giant bullrush (paille fine). Willow thickets are common.

The salt marshes are extensive, and consist of salt marsh grass, couch grass, big and little cord grasses, and black rush. Some of the common woody plants that grow on the raised natural levee ridges include live oak, toothache tree, hackberry, haw-thorns, oppanax, marsh elder, Baccharis, and salt matrimony-vine.

In the higher elevations there are numerous poisonous plants to both man and animal. The trees are numerous in species and abundance.

Marsh and Estuarine Ecology - the Natural System

The functioning of the coastal marsh ecosystem is complex and diverse. The ecosystem (Wallace, et. al., 1973a) is maintained by the inter-relationship of a full range of terrestrial and aquatic Flora and Fauna, and extremely important water exchange processes. The few species considered "valuable" to man for commercial or sports activity represent merely a small minority of life forms in the marsh. They are, for the most part, a select group near the top of the food chain supported by an enormous lower level biomass. The strength of the system lies in its diversity. However, there are key processes, biotic types, food chains, and habitats that ultimately control its health. When these are impaired or destroyed, the entire system faces gross reduction of productivity or death.

Of basic importance to the ecosystem are the input of fresh river water and sediment through periodic floodings and marine tidal action. Silt laden river water is a prime source of the inorganic nutrients required by plants. Marine tidal action flushes detritus from the marsh into the estuary, and provides access for nursery crabs, shrimp, and fish. The mixture of riverine and marine water establishes the salinity balance necessary for the production of marsh vegetation, the prime source of organic detritus.

The organic detritus cycle is the biotic base of the entire marsh. It starts with the photosynthetic conversion of inorganic nutrients into forms useable by higher forms of life. One portion of the cycle is essentially aquatic. Dissolved nutrients are photosynthesized into phytoplankton and algae, which are in turn fed upon by copepods, shrimp larvae, and oysters.

The most important portion of detritus cycle however, is the production of marsh vegetation. Marsh plants contribute far more vegetative material than is normally consumed by the herbivores and are the single most important source of organic detritus. Both portions of this cycle are kept viable by riverine input and tidal action.

Marsh vegetation is eaten and returned to the system as respiratory loss and feces; at death it is decomposed and converted to other life forms. Bacteria convert the cellulose and carbohydrates to concentrated protein. Some detritus is consumed on the marsh, but much is flushed into adjacent water by tidal action. There, detritus feeding organisms, including shrimp and oysters, crabs, and zoo-plankton, are able to make use of the partially decayed matter. The secondary consumers, such as minnows, plankton-feeders and predatory fish, are dependent upon the

detritus-feeding organisms. The carnivores-alligators, mink, otter, raccoons - rely upon aquatic life and herbivores for their survival.

All trophic levels contribute to organic detritus and nutrient cycling through production of feces and excreta and eventual death. Thus a combination of physical factors such as tidal exchange, riverine input of nutrients, climate, and the recycling of materials by the biotic system serve to maintain the productivity and stability of the marsh-estuarine system. When tidal effects and river input are stopped, movement of both detritus and inorganic nutrients are greatly curtailed with a subsequent lowering of biomass and productivity.

Marsh and Estuarine Ecology - the Modified System

The Pontchartrain New Town (Wallace, et. al., 1973a) area was an example of this marsh-estuary system until the area proposed for the New Town was leveed. It functioned as an estuary of Lake Pontchartrain. Tidal exchange supplied nutrients flushed the marsh, and allowed migration of commercially important organisms. With construction of the levee, the area has become a closed system receiving most of its water input from relatively sterile, fresh rain. In this modified marsh, unaffected by tides or direct sediment deposition, the organic matter will become incorporated with the soil. Concentrations of essential plant nutrients are low in these peat soils, and there is no significant source of new nutrients.

Productivity of the Pontchartrain New Town area in terms of total biomass and contribution to the Lake Pontchartrain marine system has been greatly lowered. Without adequate water exchange, the marsh vegetation type has changed as a result of modified salinity conditions, been reduced through lack of nutrient replacement, or been destroyed. The loss of tidal flushing has reduced free detritus movement and eliminated access for nursery crabs, shrimp, and fish. The upper consumer levels of the estuary system have been severely limited or destroyed through destruction of lower levels of the food chain and habitat. Given time, the area will develop into a fresh marsh or become open water; without restoration of the land to its natural brackish condition, its high-productivity potential will be lost.

Maintenance of a suitable habitat in terms of food and shelter is the controlling factor in animal distribution. In spite of die-offs caused by disease, fire, storm and pollution damage, a species will probably recover if the habitat and ecologic niche are still intact. This has proven true for muskrat and nutria in Louisiana marshes, however, destructive. Thus, for an ecological cycle

to be complete, self-maintaining, and productive, the habitat pieces that support a particular species within the marsh-estuary cycle should be kept intact.

The following illustrates the function of the estuary-marsh food cycle and indicate more specific habitat requirements for various species within the ecosystem.

Plant Ecology

Several studies of plant ecology have been completed in the coastal marsh zone of Louisiana. Of these studies, only a few have been done in or near Orleans Parish; Table 9 lists species found by Parret (1971) in what is considered the most complete study of Louisiana Coastal areas, these species are also found in the New Orleans area. In order to attain a valid, description of the vegetation in the area, a comparison of these studies was utilized along with a comparison of probable successive changes in vegetation past to present. Table 10 presents a partial list of plant species which grow or can be grown in the area.

The study area has been described as a combination urban area and marsh area located between two estuarine zones and in close proximity to the active delta lobe of the Mississippi River. Penfound and Hathaway (1938) described the area as part of the "fresh water regions at or near the Gulf level" and made up of hardwood alluvial ridges and intervening swamp, marshes and lakes.

A plant occurs in an area because of the individual requirements of the species, its relative tolerance and adaptability, and the variation in environmental conditions. Zonation of marsh vegetation is primarily the result of the two interrelated factors of water salinity and topography (Smith).

Modifications and sometimes total change (irreversible) have occurred in the Coastal Marsh Zone as a result of:

1. Canals - allow salt water into fresh water;
2. Spoil banks - a by-product of canals, obstruct drainage and impound water;
3. Petroleum exploration and production;
4. Reclamation of wetlands;
5. Burning;
6. Alien biological agents introduced (i.e. nutria);
7. Disruption of fresh water input by leveeing rivers.

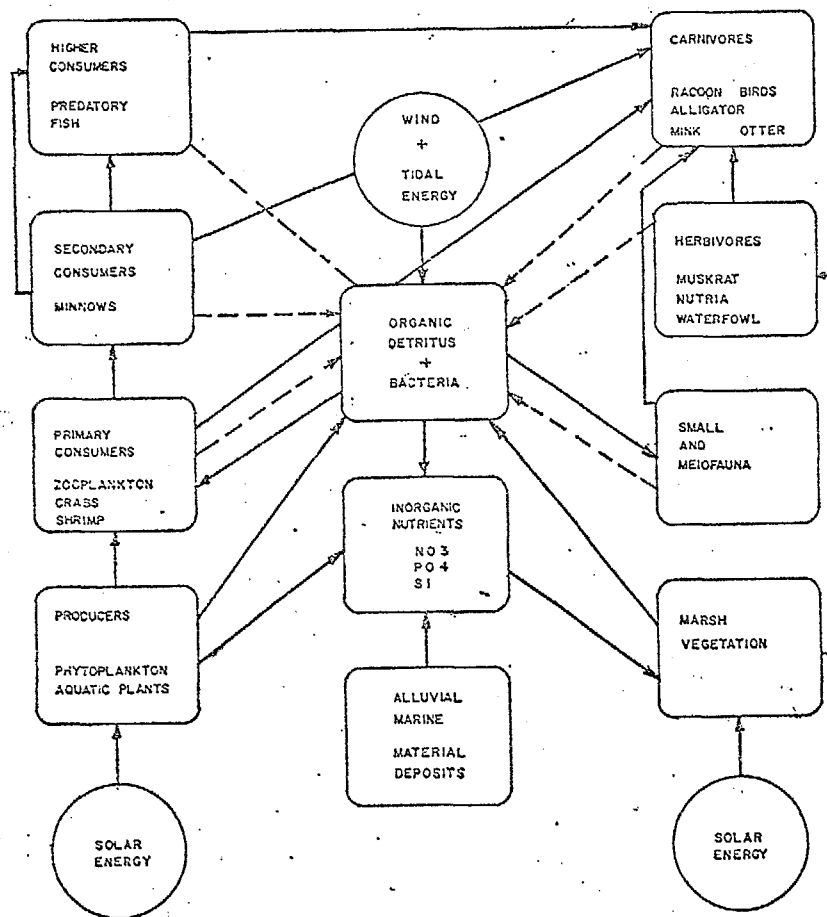


DIAGRAM OF MARSH ESTUARY FUNCTIONAL RELATIONSHIPS

Table 8
Major Species of Aquatic Vegetation in Coastal
Louisiana*

Marsh Types	Species	Acres
Emergent Vegetation		
Saline.....	Oystergrass (<i>Spartina alterniflora</i>) Glasswort (<i>Salicornia</i> sp.) Black rush (<i>Juncus roemerianus</i>) Black mangrove (<i>Avicennia nitida</i>) Saltgrass (<i>Distichlis spicata</i>) Saltwort (<i>Batis maritima</i>)	862,973
Brackish.....	Wiregrass (<i>Spartina patens</i>) Threecorner grass (<i>Scirpus olneyi</i>) Coco (<i>Scirpus robustus</i>)	1,203,790
Intermediate.....	Wiregrass (<i>Spartina patens</i>) Deer pea (<i>Vigna repens</i>) Bulltongue (<i>Sagittaria</i> sp.) Wild millet (<i>Echinochloa walteri</i>) Bullwhip (<i>Scirpus californicus</i>) Sawgrass (<i>Cladium jamaicense</i>)	650,576
Fresh.....	Maiden cane (<i>Panicum hemitomon</i>) Pennywort (<i>Hydrocotyl</i> sp.) Pickerelweed (<i>Pontederia cordata</i>) Alligator weed (<i>Alternanthera philoxeroides</i>) Bulltongue (<i>Sagittaria</i> sp.) Water Hyacinth (<i>Eichhornia crassipes</i>)	1,193,325
Total		3,910,664

*

Source: Vegetative type map of the Louisiana Coastal Marshes, 1968.

Much of the area is a part of an old deltaic lobe from the Mississippi River and characterized by natural levees or "front lands" (Penfound and Hathaway, 1938). As part of the gradually sloping land behind the levee, the area once acted as an overflow catch basin. These backlands were characterized by cypress-gum swamps and/or marshes, depending upon the amount of salinity. These backlands were drained by sluggish, meandering bayous, and characterized by insignificant levees. Occasionally former barrier beaches occur as circular to elongated islands which are oak vegetated.

There are major grass botanical indicators of the marsh zone along the Louisiana coast. These are grouped according to fresh, brackish and saline waters.

fresh water - Panicum hemitonon - paille fine, a major peat forming grass

saline water - Spartina patens - cord grass

brackish water - Spartina alternifolia - oyster grass

A brackish marsh usually occurs as an ecotone between saline and fresh water environments. It probably has the highest productivity as a result of the unique balance of productivity between saline and fresh conditions. In its simplest form this delicate balance occurs when during storm tide saline water adds suspended sediment to the marsh, replenishing nutrient supply. The process rejuvenates vegetation and fauna response making it one of the most productive fishery and wildlife habitats in the nation (Palmisano, 1970).

The value of such an ecosystem is high for both man and animal:

1. It serves as a residence for game birds - valuable to man as sport, education, and recreation.
2. It serves as a winter home for ducks - valuable to man as sport, education, recreation.
3. It serves as a home and food for muskrat - sport, education, economic value to man.
4. It serves as breeding grounds for shrimp, fish, other organisms - economic and industrial value to man.

Wildlife and Fisheries

The only wildlife and natural fisheries habitats in New Orleans are located in the Eastern New Orleans wetlands and on the Lower Coast of Algiers.

Natural levees support a wide range of upland wildlife. Rabbits, mice and squirrels are particularly abundant. Formerly the levees also provided habitat for bear and mountain lions. The backswamps further provide habitat for a wide range of amphibians and aquatic life forms as well as nutria, muskrats and raccoons. Although the whole area supports numerous snakes, the natural levees and backswamps provide the most opportune habitat. The natural levees and backswamps also provide the only nesting sites for birds which nest above ground.

Impounded marshes provide habitat for a number of mammals; the most notable are raccoon, nutria, and muskrat. Trappers report occasional mink. The expanses of open fresh-water provide excellent waterfowl habitat where marsh vegetation occurs; the available food is plentiful.

Numerous ducks are usually present as well as coot (Fulica americana), American egrets (Casmerodius albus), snipe (Capella gallinago), Great blue heron (Ardea herodias), and Green heron (Butoroides virescens). The black-necked stilt (Himantopus mexicanus) are abundant.

The Chef Menteur and Lake Borgne marshes sustain a varied fauna. Shellfish include the brackish marsh clam (Polymesoda caroliniana), the horse mussel (Melampus demissus), and blue crabs (Callinectes sapidus) among others. The commercial shrimp (Penaeus spp) were noted in the open water bodies. Amphipods occur throughout these marshes.

Discussions with local fishermen and comparisons with similar marshes indicate that the predominant fish spawning in the Chef Menteur and Lake Borgne marshes should include: Speckled trout (Cynoscion nebulosus), Red drum (Sciaenops ocellatus), Bay anchovy (Anchoa mitchilli), and Bay silverside (Menidia beryllina). Larval fish developing in marsh waters typical of Chef Menteur and Lake Borgne area include: Croaker (Micronogon undulatus), Spot (Leiostomus xanthurus), Menhaden (Brevoortia patronus), mullet (Mugil cephalus), and Sea catfish (Galeichthys felis). The Speckled trout, red drum, Croaker, Spot and Menhaden are of commercial importance in Louisiana. Killifish are abundant throughout the marshes. Predominant species include Cyprinodon variegatus, Fundulus gradis, Fundulus jenkins, and Lucania parva.

W-10-12345678901234567890

FRESHWATER MARSH

PONDWEED
WATER LILY
PAILLE FINE
THREE-CORNERED GRASS

CATTAIL

BALDCYPRESS

ROSE MALLOW
ARROW-HEAD
COPPER IRIS
RED MAPLE

BLUE FLAG
BUTTON BUSH
DWARF PALMETTO

SWEETGUM

YAUPON

DEVILS-WALKING STICK

JACK-IN-THE-PULPIT

SYCAMORE
SWAMP AZALEA
PIGNOT HICKORY
CARDINAL-FLOWER
SWAMP PRIVET

DAHOON

MAYAPPLE

ROUGHLEAF DOGWOOD
BLACKGUM

WITCH-HAZEL

LIVE OAK

FALSE DRAGONS-HEAD
HAWTHORN
SQUAWWEED

BLACK WILLOW

PECAN

POSSUMHAW
CRANE'S-BILL

SOUTHERN MAGNOLIA
OAKLEAF HYDRANGEA

LOUISIANA PALMETTO

SILVERBELLS

SLASH PINE
MOUNTAIN LAUREL

PHLOX

SHINING SUMAC
WILD ROSE

TREE SPARKLEBERRY

PAWPAW

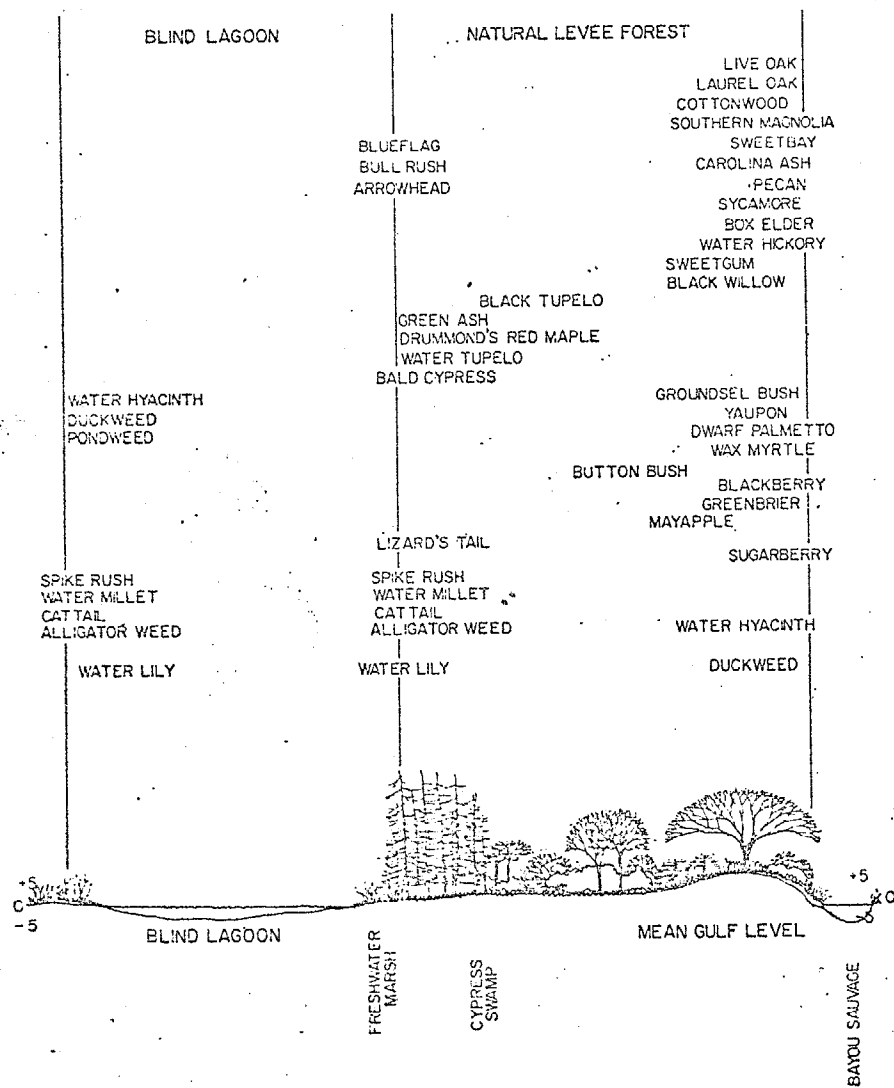
FRINGETREE

NATURAL LEVEE VEGETATION (ON SILTS AND CLAYS)

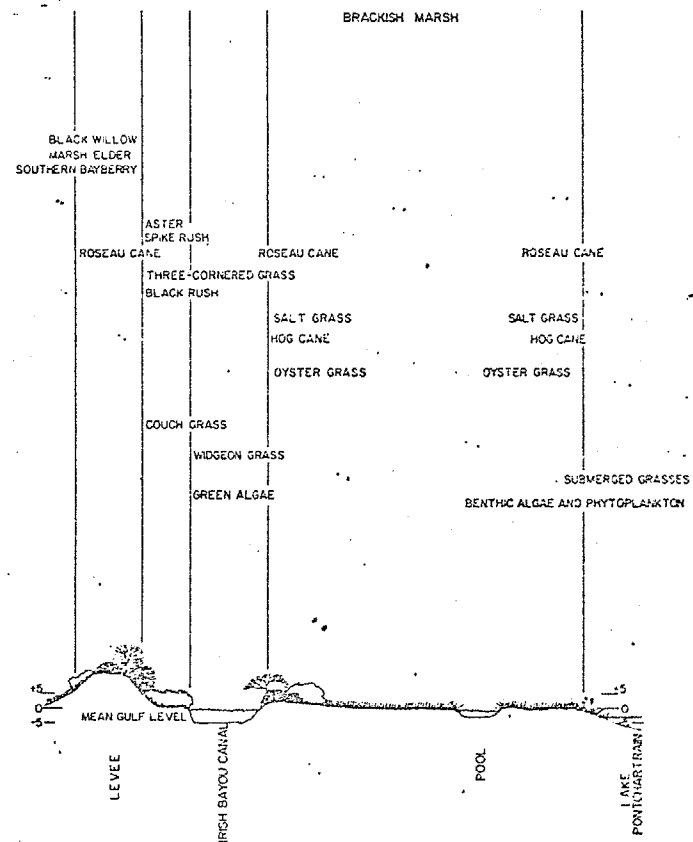
UPLAND FOREST TYPES (ON SANDY FILL ABOVE +4')

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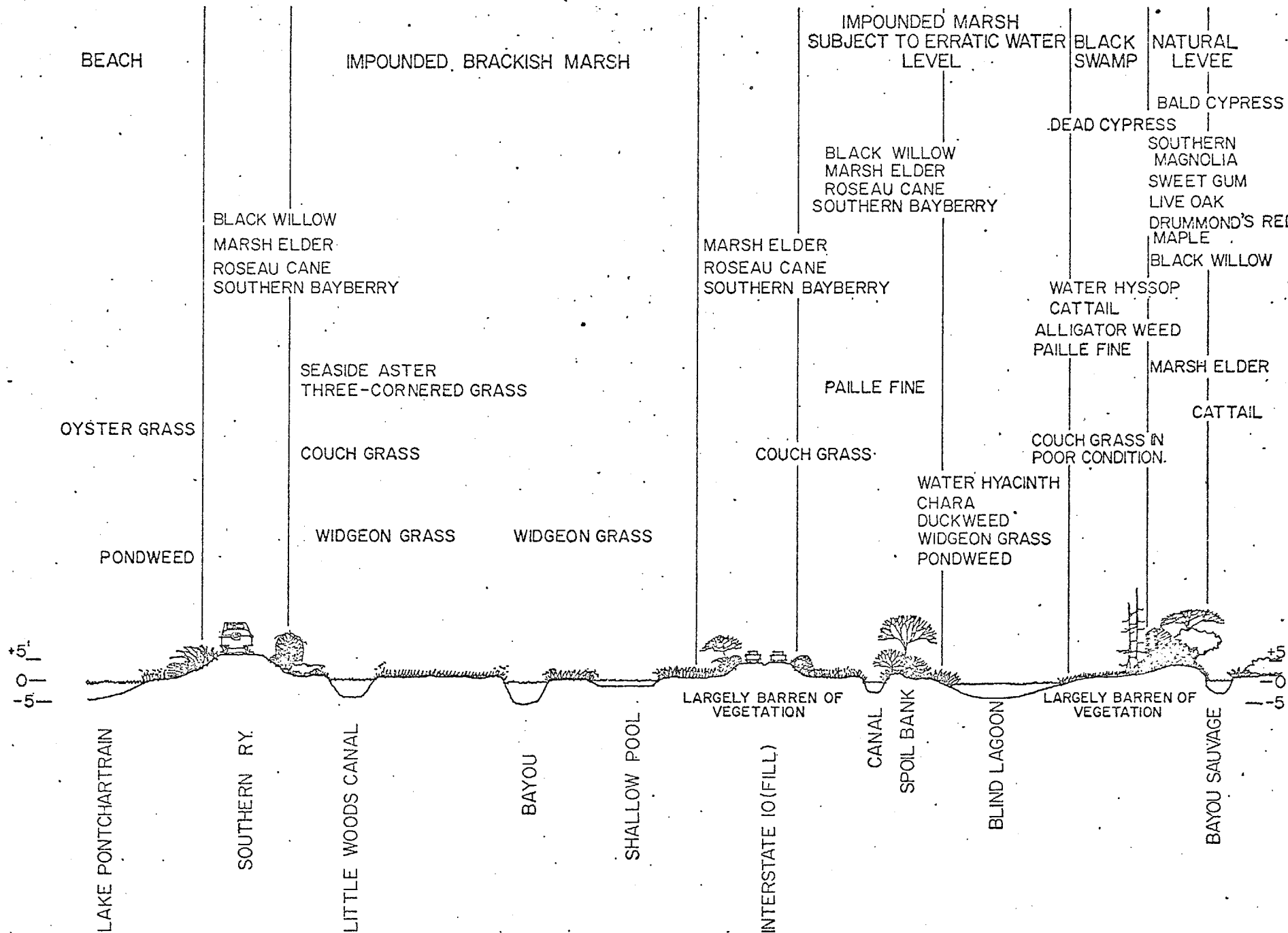
SCHEMATICIZED DISTRIBUTION OF FLORA (From Wallace, et. al., 1973 a)



DIAGRAMMATIC TRANSECT FROM BLIND LAGOON TO BAYOU SAUVAGE SHOWING IDEAL VEGETATION CONDITIONS. (FROM WALLACE, ET.AL., 1973)



DIAGRAMMATIC TRANSECT FROM LAKE PONTCHARTRAIN TO BAYOU SAUVAGE SHOWING EXISTING MARSH CONDITIONS (FROM WALLACE, ET.AL., 1973A)



DIAGRAMMATIC TRANSECT FROM IRISH BAYOU TO
LAKE PONTCHARTRAIN SHOWING EXISTING
BRACKISH MARSH, OPEN TO TIDAL FLOW
(FROM WALLACE, ET. AL. 1973A)

In addition, almost all of the fresh water marsh fish species will also occur in the brackish marshes due to the low salinity conditions.

The natural areas presently provide habitat for a great variety of waterfowl. The areas of freshwater marsh, though small and scattered, are excellent potential food sources. Both Bacopa monnieri and Zizaniopsis miliacea provide food for the waterfowl utilizing the open freshwater areas of Blind Lagoon, as well as providing nursery areas for the fish occurring in the Lagoon. Both the waterfowl and fish populations can be expected to decrease if some freshwater marsh habitat is not maintained adjacent to Blind Lagoon.

The impounded marshes in the area are generally operating at a reduced biotic level. Interchange with the Gulf has been cut off and the system is gradually changing to a freshwater one. Although marine fish occur occasionally, their access is limited to that provided by improperly functioning tide gates and drainage culverts. The blue crab (Callinectes sapidus) which enters the impounded areas in a juvenile form, is the only marine creature occurring almost throughout the area.

Freshwater fish are abundant throughout the impounded areas. Discussions with local fishermen and examinations of the catch indicate that the following fish are predominant in these areas:

Needlenose garfish - Strongylura marina

Alligator gar - Lepisosteus spatula

Choupique (Bowfin) - Amia calva

White perch (Sac a lait) - Morone americana

Largemouth bass - Micropterus salmoides

Small mouth bass - Micropterus dolomieu

Blue-gill sunfish - Lepomis macrochirus

Catfish - Ictalurus furcatus

White trout (San sea trout) - Cynoscion arenarius

The freshwater snail (Physa sp.) occurs but does not appear to be abundant.

Crayfish (Procambarus spp.) can be found throughout the impounded areas.

The grass shrimp (Palcomonetes pugio) can be found in most bayou channels.

Table 9

Biological And Hydrological Sampling
Stations - Lake Borgne And Vicinity.
(From Perret et. al., 1971)

Sta. No.	Location Name	Coordinates		Depth to Bot. (ft.)	Type of Sample						
		N Lat.	W. Long.		Sal.	Temp.	Oxygen	Chem.	Travel	Seine	Plank ²
1.....	Unknown Pass.....	30°06'22"	89°41'32"	25'	X	X	X	X	X		
2.....	Geoghegan Canal....	30°10'56"	89°43'08"	15	X	X	X	X	X		
3.....	Marques Canal.....	30°05'06"	89°47'08"	15	X	X	X	X	X		
8.....	Bayou Thomas.....	30°02'34"	89°49'18"	20	X	X	X	X	X		
9.....	Bayou Bienvenue.....	29°59'26"	89°52'04"	15	X	X	X	X	X		
20.....	Little Rigolets.....	30°03'36"	89°38'06"	4	X	X				X	

Tables 12 and 13 display summarized fisheries catch data by Perret (1971). These data include samples of fish, shellfish, and zooplankton within the study area.

The description of the current state of the New Orleans environment, and the natural forces influencing environmental conditions provide the "jumping off" point from which a coastal zone management plan must operate.

A general description of the natural environment in the municipal boundaries of the City of New Orleans was presented in this

Table 10

Monthly Average Surface Salinity, Temperature and Catch Per Unit of Effort in Study Area from April, 1963 Through March, 1969.
(From Perret, et. al., 1971)

	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Year
STATION													
Number of seine samples	2	2	2	2	2	2	2	2	2	2	2	2	18
Salinity ppt	7.9	11.2	17.2	12.4	19.9	18.0	16.4	13.3			8.8	13.5	
Temperature C°	23.3	31.6	30.4	30.6	27.6	24.2	14.8	13.6			20.3	23.8	
Commercial Species*													
Vertebrate													
<i>Brevoortia patronus</i>	2	930	4	863	15				2		25	149	
<i>Dorosoma cepedianum</i>					5								
<i>Galeichthys felis</i>	3	5	12	8	10	22	.5						
<i>Caranx hippos</i>			5										
<i>Bairdiella chrysura</i>		18	1	1		3	.5	.5			1	3	
<i>Cynoscion arenarius</i>		14	4	2	3	1	2	1					
<i>Cynoscion nebulosus</i>			1			1	3	.5					
<i>Leiostomus xanthurus</i>		5	1	3		1	.5				2	1	
<i>Menticirrhus americanus</i>			2			3	2						
<i>Micropterus undulatus</i>	22	4	11	125	4	4		11			.5	20	
<i>Pogonias cromis</i>	5					.5							
<i>Sciencops ocellata</i>							.5						
<i>Archosargus probatocephalus</i>	5				2								
<i>Lagodon rhomboides</i>								2					
<i>Prionotus tribulus</i>								2					
<i>Mugil cephalus</i>	4	3	3	5		2	2				3	2	
<i>Menidia beryllina</i>	14	7	30	7		21	14	9			2	11	
<i>Citharichthys spilopterus</i>	2		.5	1		.5	4						
<i>Paralichthys lethostigma</i>	2	.5	.5										
Invertebrate													
<i>Penaeus setiferus</i>						3	4					1	
<i>Penaeus duorarum</i>								.5					
<i>Penaeus aztecus</i>	7	35	2			.5						11	
<i>Callinectes sapidus</i>	1		2	.5			1				.5	.6	
Other Species													
Vertebrate													
<i>Dasyatis sabina</i>	2		1	2	1		2				1	1	
<i>Alosa chrysochloris</i>	1												
<i>Dorosoma petenense</i>					.5								
<i>Anchoa hepsetus</i>					9								
<i>Anchoa mitchilli</i>	46	5	496	247	1,181	85	418	726			72	364	
<i>Synodus foetens</i>				.5									
<i>Strongylura marina</i>	2	2	2		5	3	.5						
<i>Hyporhamphus unifasciatus</i>					5								
<i>Cyprinodon variegatus</i>						1							
<i>Fundulus grandis</i>	4	.5				3	.5						
<i>Fundulus similis</i>	9	5	.5	5	.5	.5					1	2	
<i>Syngnathus scovelli</i>						.5							
<i>Oligoplites saurus</i>		9	3	2									
<i>Yomera setipinnis</i>		.5											
<i>Gobiosoma boscii</i>	1												
<i>Microgobius gulosus</i>	.5												
<i>Chasmodes saburrae</i>						.5							
<i>Meuschenia martinica</i>	19	7	32	9	106	6	6	10			32	25	
<i>Gobiosoma strumosus</i>	.5												
<i>Sphaeroides nephelus</i>	6	2	1	11	1	4	1				3	8	
<i>Chilomycterus schoepfi</i>		1											
Invertebrate													
<i>Lolliguncula brevis</i>		3			1	1	1	2				1	
<i>Palaemonetes vulgaris</i>	7					3					1	1	
STATION													
Number of trawl samples	25	23	11	30	28	25	28	7	16	22	17	257	
Salinity ppt	11.1	12.9	11.8	13.3	13.8	11.4	14.9	12.6	9.9	8.3	8.3	7.8	11.8
Temperature C°	22.4	24.4	30.1	30.0	30.7	27.9	24.8	16.5	13.1	13.2	12.7	13.8	22.9

	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Year
Commercial Species													
Vertebrate													
<i>Lepisosteus spatula</i>	1				2	1	2	3		3	1	1	2
<i>Elops saurus</i>		T			1								T
<i>Brevoortia patronus</i>	20	5	8	6	2	4	30	2		47	5	9	
<i>Dagre marinus</i>				4	5	1							
<i>Galeichthys felis</i>	2	2	2		7	5	1	1					
<i>Caranx hippos</i>						T							
<i>Bairdiella chrysura</i>	20	1	2	1	2	1	1	4	2	4	1	1	
<i>Cynoscion arenarius</i>	2	6	19	8	12	3	5	1	1	1	1	5	
<i>Cynoscion nebulosus</i>	1	1	2		1	3		4	3	3	1	2	
<i>Leiostomus xanthurus</i>	27	12	10	3	5	3	3	1	1	4	3	1	6
<i>Menticirrhus americanus</i>	T	1	2	3	2	2	1	T					
<i>Micropterus undulatus</i>	109	48	38	28	11	3	1	13	5	14	58	32	
<i>Pogonias cromis</i>	T					T							
<i>Sciencops ocellata</i>										7			
<i>Lagodon rhomboides</i>	1	1	2	2	1	3	T			T			
<i>Chaetodipterus faber</i>	1	1	2	1	1	1	T						
<i>Trichiurus lepturus</i>	1	1	1	1	1	1	T						
<i>Prionotus tribulus</i>	3	1	T		1	1	1	1		1	1	1	
<i>Poronotus triacanthus</i>	T	2	3	1							1	1	
<i>Mugil cephalus</i>										32		3	
<i>Menidia beryllina</i>										1	1	T	
<i>Citharichthys spilopterus</i>				T	2	1	3				1	1	
<i>Paralichthys lethostigma</i>	T	3	5	2	3	2	1	T		1	2	3	2
<i>Trinectes maculatus</i>	1	3		1	3	1					2	1	
Invertebrate													
<i>Penaeus setiferus</i>	2	1	1	12	124	13	9	1		T	3	17	
<i>Penaeus duorarum</i>	T	1	1	1		2	2	4				1	
<i>Penaeus aztecus</i>	42	130	73	35	39	4	3	1	1	3	2	4	28
<i>Callinectes sapidus</i>	6	4	4	2	2	2	1	1	2	1	6	2	
<i>Menippe mercenaria</i>		T										T	
Other Species													
Vertebrate													
<i>Dasyatis sabina</i>		T		T		T					1	T	
<i>Alosa chrysochloris</i>					T	T				T	2	T	
<i>Dorosoma petenense</i>					2	2	T						
<i>Anchoa hepsetus</i>			1										
<i>Anchoa mitchilli</i>	82	66	80	60	96	40	341	82	433	78	651	135	163
<i>Synodus foetens</i>		1	3	2	1	2	1	2		1			
<i>Myrophis punctatus</i>		T											
<i>Cyprinodon variegatus</i>			2		1						2	1	
<i>Fundulus grandis</i>													
<i>Fundulus similis</i>											T		
<i>Syngnathus scovelli</i>													
<i>Centropomus philadelphicus</i>							T						
<i>Chloroscombrus chrysurus</i>			T										
<i>Oligoplites saurus</i>				1									
<i>Gobionellus hastatus</i>													
<i>Gobiosoma boscii</i>	T	2	1				T	T		1	1	1	
<i>Microgobius gulosus</i>													
<i>Chasmodes saburrae</i>	T	T	3							T			
<i>Peprilus paru</i>			1		T	2							
<i>Polydactylus octonemus</i>			2										
<i>Achirus lineatus</i>			T		7	3	4						
<i>Symphurus plagiatus</i>		T	2	1	4	2	2	T	1	4		1	3
<i>Gobiosoma strumosus</i>		1	T	T							1	1	
<i>Sphaeroides nephelus</i>	T	8	7	2	2	4	1	3	1		1	1	
<i>Opsanus beta</i>		4	3	2	T	T	T	1			T		
<i>Porichthys porosissimus</i>		3											T
Invertebrate													
<i>Lolliguncula brevis</i>		3	1	1	1	1		1		1	2	1	
<i>Alpheus heterochaelis</i>					T	1							
<i>Palaemonetes vulgaris</i>	2	4				1		1		2	58	6	
<i>Squilla empusa</i>					1	1							
<i>Penaeus herbstii</i>		2	1	1	1			1		1	4	1	

Table 11

Species composition and relative abundance of major plankters in monthly plankton aliquots with settled volume per 100 m³, salinity (ppt), and water temperature (C°) as collected April 1, 1968, through March 31, 1969, in Louisiana.

	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
STATION (Study Area I)												
Settled Vol. cc	193	460	231	428	91	64	87	48			158	80
Salinity ppt	12.0	15.5	17.0	17.1	21.3	18.7	20.0	14.6			9.5	10.8
Temperature C°	23.3	26.0	29.8	30.5	28.0	28.1	25.4	15.3			10.0	10.2
Taxon												
10 COELENTERATA	P ¹	P					P				P	P
0 <i>Nemopsis bachci</i>											29	
10 CTENOPHORA	P	P	P	P	P	P	P	P				P
10 MOLLUSCA												
3 Gastropoda												
5 Pteropoda				798	248		59308	1509				
8 Pelecypoda LAR				586	108							
10 ANNELIDA												
8 Polychaeta LAR							15	2				
0 <i>Nereis succinea</i>											6	
10 ARTHROPODA												
8 Crustacea NAU	4614	1628	44	1111	208	477	1388	220			453	125
7 Ostracoda							17	2			143	
7 Copepoda COP	T ²	T	T	T	T	T	T	T			T	T
0 <i>Acartia</i> sp.	2352	130844	1140	6317	641	1960	46493	1615			2551	615
0 <i>Centropages</i> sp.	187	591		615	532		44	17				
0 <i>Corycaeus</i> sp.								3				
0 <i>Eurytemora hirundoides</i>	3319	1062	9054		493		1	40				
0 <i>Halicyclops fosteri</i>	92					73	190	12				
0 <i>Labidocera aestiva</i>	5977	8411	439		208	24	228	63				
0 <i>Oncaea mediterranea</i>							1					
0 <i>Temora</i> sp.						472	620	70				
0 <i>Undinula vulgaris</i>							115	107				
5 Amphipoda												
0 <i>Ampelisca</i> sp.											61	
0 <i>Cerapus</i> sp.						24	3					
5 Isopoda												
0 <i>Acgathoa oculata</i>						35	28	6				
5 Cumacea												
0 <i>Leptocuma minor</i>								6				
0 <i>Oxyurostylis smithi</i>							3					
5 Mysidacea												
0 <i>Mysidopsis almyra</i>							6					
5 Decapoda LAR	6077	1156	311	4641	9141	541	1647	5				
3 Penaeidea												
0 <i>Lucifer fazoni</i>							2	3				
2 Caridea												
0 <i>Leander tenuicornis</i>						520						
3 Brachyura MEG							70	4				
10 CHAETOGNATHA												
0 <i>Sagitta hispida</i>		140					70	11				
10 CHLOROPODA												
9 Urochordata												
0 <i>Glyptothorax</i> sp.	180	145	890			611	547	47				
8 Osteichthyes EGG	123	158	679	470	161	25	10					
8 Osteichthyes LAR					6			2				

¹P—Ctenophores present in large numbers.

²T—Trace. Small amount in sample; no counts given.

(From Perrert, et. al., 1971)

Table 12

Distribution of Plankton Samples Taken In Study Area
By Salinity and Temperature Intervals Showing Number
Of Hauls And Mean Settled Volume Per 100m³ April 1,
1968, Through March 31, 1969.
(From Perret, et. al., 1971)

Temp Int C°	Salinity interval ppt										Aver.
	0- 0.2	0.3- 1.9	2.0- 4.9	5.0- 9.9	10.0- 14.9	15.0- 19.9	20.0- 24.9	25.0- 29.9	30.0+		
5.0- Smpla.				1	3					4	
9.9 Vol. cc.				247	101					138	
10.0- Smpla.				1	1	3				5	
14.9 Vol. cc.				23	143	27				49	
15.0- Smpla.					4					4	
19.9 Vol. cc.					50					50	
20.0- Smpla.				4	8	4	1			12	
24.9 Vol. cc.				135	188	148	13			142	
25.0- Smpla.				1	1	7	3			17	
29.9 Vol. cc.				5	243	463	160			231	
30.0- Smpla.					3	5	2			10	
34.9 Vol. cc.					549	324	120			251	
Aver. Smpla.				7	15	19	11				
Vol. cc.				116	207	291	139				

section. This description provides a rudimentary baseline from which decisions can be made as to whether the environment should be maintained in its present state, or whether it should be modified. The inventory of existing conditions also provides a general means for measuring environmental changes due to natural and man-made modifications.

The management of the environment must operate within the framework provided by nature. The complex inter-relationship between water regimens, tidal actions, biotic parameters, climatology and many other factors must be well understood before a management plan can be implemented. Without a knowledge of these inter-relationships, there is no way to predict the outcome of the various management actions; as a result environmental degradation could be facilitated rather than abated. Recognition of this fact causes one to realize that additional data must be compiled and correlated on the bases of small unit areas so that the implications of future actions can be fully understood.

Phylum: PROTOZOA
Class: Mastigophora
Order: Dinoflagellida
Noctiluca scintillans (Macartney)

Phylum: COELENTERATA
Class: Hydrozoa
Liriope tetraphylla (Chamisso and Eysen-
hardi)
Phialidium folleatum (McGrady)
Obelia sp.
Nemopsis bachei L. Agassiz
Order: Siphonophora
Abylopsis sp.
Diphyys dispar Chamisso and Eysenhardt
Eumecagomus hyalinum Quoy and Gaimard
Muggiaca sp.

Phylum: CTENOPHORA
Class: Tentaculata
Pleurobrachia sp.
Mnemiopsis mcecradyi (Mayer)
Class: Nuda
Beroe ovata (Bosc)

Phylum: MOLLUSCA
Class: Pelecypoda-Larvae
Class: Gastropoda
Order: Pteropoda

Phylum: ANNELIDA
Class: Polychaeta
Nereis succinea (Frey and Leuckart)

Phylum: ARTHROPODA
Class: Crustacea
Subclass: Branchiopoda
Order: Diplostraca
Suborder: Cladocera
Penilia avirostris Dana
Podon polyphemoides (Leuckart)
Eucadne tergetina Claus
Subclass: Ostracoda
Subclass: Copepoda
Ampelisca sp.
Atylus sp.
Carinogammarus mucronatus Say
Cerapus sp.
Corophium sp.
Suborder: Hyperidae
Hyperia atlantica Vosseler
Hyperia sp.
Phronima sp.
Primno sp.
Suborder: Caprellidea
Caprella sp.
Order: Isopoda
Suborder: Flabellifera
Sphacroma quadridentatum (Say)
Aegathoa oculata (Say)
Livoneca ovalis (Say)
Suborder: Valvifera
Edotia montosa (Stimpson)
Synidotea sp.
Order: Cumacea
Oxyurostylis smithi (Calman)
Leptocuma minor (Calman)
Order: Mysidacea
Mysidopsis almyra Bowman

Order: Calanoida
Acartia tonsa Dana
Acartia danae Giesbrecht
Acartia spinata Estöky
Candacia bipinnata Giesbrecht
Centropages hamatus (Lilljeborg)
Centropages furcatus (Dana)
Eucalanus pileatus (Giesbrecht)
Eucalanus sp.
Euchaeta marina (Prestandrea)
Eurytemora hirundoides (Nordquist)
Labidocera aestiva Wheeler
Labidocera sp.
Mormonilla sp.
Paracalanus sp.
Pontella sp.
Pontellopsis sp.
Rhincalanus cornutus Dana
Temora turbinata (Dana)
Temora stylifera (Dana)
Tortanus sp.
Undinula vulgaris (Dana)

Order: Cyclopoida
Clytemnestra scutellata Dana
Copilia mirabilis Dana
Corycaeus sp.
Halicyclops fosteri (Wilson)
Oithona sp.
Oncaea mediterranea (Claus)
Oncaea sp.
Sapphirina nigromaculata Claus
Sapphirina sp.

Order: Harpacticoida
Alteutha sp.
Euterpina acutifrons (Dana)
Macrosetella sp.

Order: Caligoida
Caligus sp.

Subclass: Malacostraca
Order: Amphipoda
Suborder: Gammaridae
Order: Stomatopoda LAR
Order: Decapoda
Suborder: Natantia
Section: Penaeidea
Acetes americanus carolinus Haz
Lucifer fazoni Borradaile
Section: Caridea
Leander tenuicornis (Say)
Suborder: Reptantia
Section: Anomura ZOE
Section: Brachyura MEG
Callinectes sapidus Rathbun

Phylum: ECHINODERMATA
Ophiopluteus LAR

Phylum: CHAETOGNATHIA
Sagitta hispida Conant
Sagitta cefata Grassi

Phylum: CHORDATA
Subphylum: Urochordata (Tunicata)
Class: Larvacea
Gikopleura sp.
Class: Thaliacea
Order: Doliolida

Orleans Parish has been visited on many occasions by professional archaeologists whose purpose has been to inventory and catalogue what archaeological sites are to be found within the parish limits.* The results of these visitations is the recording, collecting, and even excavation of a number of archaeological sites from which data of the prehistoric, or pre-European temporal horizon has been obtained. All such visitations that have occurred were relatively rapid reconnaissances rather than detailed and exacting archaeological surveys. It is, therefore, highly improbable, that the total extant surface evidence of prehistoric occupation for Orleans Parish has been discovered. Further, given the rapid rate of deltaic subsidence that is the geologic characteristic of the Pontchartrain Basin, it is additionally probable that archaeological sites exist beneath the current levels of marsh and swamp and that they will only be discovered during some sort of subsurface construction activity.

It should be noted that archaeological evidence in this country is broken down into two broad categories, historic and prehistoric. Historic archaeology deals with the remains of European colonial through early American periods, and historic sites include forts, houses, business districts, shipwrecks and the like. On the historic archaeological level, the whole of populated Orleans Parish can be considered a historic archaeological site of some significance. It is not the intent of this summary to detail the potential and significance of the historic component of the archaeological heritage of New Orleans, but it should be emphasized that every square of New Orleans occupied before 1900 will yield valuable data concerning the history and development of this city and of the American people when investigated by the archaeologist.

As previously stated, Orleans Parish has received the consideration of archaeologists on a reconnaissance level on several occasions and a number of prehistoric archaeological sites have been recorded. It is the purpose of this summary to indicate the current state of the prehistoric archaeological potential of Orleans Parish as can be gleaned from prior reports and from my own personal observations.

Archaeological Chronology

As a result of several excavations and a considerable number of surveys undertaken in Louisiana and adjacent areas during the past several decades, a relatively reliable sequence of cultural phases has been established that is generally applicable to the

coastal region of southeast Louisiana. Each of these phases is defined by its own characteristic attributes and temporal placement. These phases are arbitrary divisions created by the archaeologists and may not reflect actual cultural discontinuities that would be recognized by the prehistoric aborigines. A summary of these phases as they are generally used in Louisiana is offered below.

1. Paleo-Indian. 10,000 B. C. - 6,500/6,000 B. C.

Diagnostic Traits: Lanceolate stone projectile points with or without longitudinal fluting from the base.

Temporal Placement Bases: Projectile point typologies and cross reference with paleontologic and geologic correlations and Radio carbon dates from Avery Island, Iberia Parish.

Subsistence: Generalized Hunters and Gatherers. Excavated sites in the west show association with extinct Pleistocene megafauna, eastern sites are more general in character.

Settlement Pattern: Archaeological deposits indicate probable general nomadism with small temporary camp sites.

2. Archaic. 6,500/6,000 B. C. - 700/400 B. C.

Diagnostic Traits: Triangular projectile points, enlarged chipped stone industry including knives, scrapers, microblades, drills, and graters; beginning of ground stone industry including celts, gorgets, beads, plummets, effigies, and vessels of steatite; antler atlatl hooks, bone awls, shell ornaments, and baked clay balls of various shapes called Poverty Point Objects.

Temporal Placement Bases: Projectile point typologies, Radio carbon dates and interareal comparisons.

Subsistence: Hunting and Gathering with an increasing efficiency throughout phase. Intensive exploitation of locally available wild food stuffs.

Settlement Pattern: Period begins with small campsites indicative of intraregional transhumance and showing tendencies toward increasing sedentariness. These tendencies climax with the development of the Poverty Point

* This section was prepared for the City Planning Commission by J. Richard Shenkel, Ph. D., of the Department of Anthropology and Geography, University of New Orleans.

Culture in the terminal 1000 years of the Period. Poverty Point, a large site in West Carroll Parish, Louisiana consists of a large mound and a series of concentric semi-circular earthenridges. Further, there are satellite settlements that appear to be "feeder units" to the main site. The Claiborne Site in Hancock County, Mississippi, near the mouth of the Pearl River is a smaller, major Poverty Point site.

3. Tchefuncte. 700/400 B. C. - A. D. 250

Diagnostic Traits: First major occurrence of pottery. Vessels are conical with multiiform podal supports on bases. Design techniques include incising, stamping, brushing, and punctuation located on vessel exterior and rim. Tubular clay pipes introduced at this time. Shell and some artifacts similar to the archaic but less plentiful and less ornate.

Temporal Placement Bases: Stratigraphic excavations, radiocarbon dates, and interregional comparisons, (NOTE: Tchefuncte may date as early as 700-1000 B. C. based on typological grounds. Its later placement may be due to an extreme conservatism of Louisiana Indians or simply to a lack of sufficient radiocarbon dates on Tchefuncte period materials. Recent Radiocarbon dates from Big Oak Island in eastern Orleans Parish have indicated that the basal level of that site is 520 B. C. + 65 years. That places the Tchefuncte Phase well within its proper typological bounds.

Subsistence: Hunters and Gatherers. Coastal sites show a heavy reliance on the brackish water clam, *Rangia cuneata*. Indications of horticulture from the Morton Shell-mound, Iberia Parish, Louisiana.

Settlement Pattern: Marsh area sites are shell middens, inland sites are small low earth mounds and middens. Burials occur in middens and are primary flexed and secondary with few associated artifacts.

4. Marksville. A. D. 100/250 - A. D. 700

Diagnostic Traits: New pottery types comprised of bowls, globular and jar shaped vessels. Decoration techniques include elaborate incising, stamping, punctuation, and application of red pigments. Stylized zoomorphic motifs

often occur. Other traits include stone and ceramic platform pipes and effigies, artifacts made from exotic materials including galena, copper, quartz, and asphaltum.

Temporal Placement Bases: Ceramic typology, stratigraphic tests, extensive excavations and radiocarbon dates. (Note: Marksville is unquestionably related to the Hopewell manifestation of the Ohio Valley which dates from 300 B. C. to about A. D. 400). The reasons for the temporal discontinuities and overlaps between Marksville, Tchefuncte, and the neighboring cultures to which they are typologically related is due primarily to an insufficiency of systematically collected and dated material. A recent radiocarbon date from the upper levels of Big Oak Island in which a minor Marksville component has been identified is 90 B. C. which puts the Hopewellian influence from Ohio entering the delta slightly earlier than previously expected.

Subsistence: Coastal Marksville seems a continuation of the preceding patterns of Hunting and Gathering. A single instance of corn and squash is purported from the Marksville site, Avoyelles Parish, Louisiana. It is suspected that when controlled excavation is undertaken at a major Marksville site in the coastal zone, evidence of horticulture will be found.

Settlement Pattern: The Marksville site consists of a group of earthmounds within a semicircular, ridged, earthen wall. Domed mounds contain a central buried chamber. Primary and secondary human interments along with a quantity of funerary offerings including high quality ceramics, copper, stone, shell, and bone artifacts occur in the mound fill. Other sites consist of middens and/or mounds and lack enclosures.

5. Troyville-Coles Creek: A. D. 700 - A. D. 1100

Diagnostic Traits: Change in ceramic designs, elbow shaped clay pipes, ear spools, and mealing stones. Toward end of period small, finely chipped projectile points are introduced indicating a shift from the atlatl and dart to the bow and arrow.

Temporal Placement Bases: Ceramic typologies, stratigraphic tests, excavations, radiocarbon dates.

Subsistence: Horticulture with corn and squash as staple crops. Hunting and gathering continues as a supplement.

Settlement Pattern: Major sites composed of three pyramidal mounds around an open plaza. Houses either oval or rectangular. Satellite sites are ill defined encampments or hunting stations.

6. Mississippian. A.D. 1100 - A.D. 1600

Diagnostic Traits: Change in ceramics: shell tempered pottery, new design motifs, strap handles, effigy vessels, effigy pipes. Late in period "Southeastern Ceremonial Complex" items and European trade material occur.

Temporal Placement Bases: Ceramic typology, stratigraphic tests and ethnohistoric documentation.

Subsistence: Corn, bean, and squash horticulture, supplemented by hunting and gathering.

Settlement Pattern: Large, compound pyramidal mounds around open plaza. Extensive village areas; round, rectangular and square houses; villages occasionally surrounded by wooden palisade. Satellite homesteads and campsites.

7. Historic. A.D. 1500 - Present

Diagnostic Traits: China, glass, iron, buildings, etc.

Temporal Placement Bases: Historic documents and a very few stratigraphic tests.

Subsistence: Industrial agriculture, trade, manufacture.

Settlement Pattern: Towns, cities, plantations, forts, satellite settlements, etc.

The exact temporal placement of the archaeologically defined prehistoric phases described above, is, at best, tenuous. The number of controlled excavations with attendant radiocarbon dates is slight and the resultant interpretational difficulties are many. Further, the coastal region of Southeastern Louisiana seems to be a relatively conservative diffusion terminous where significant cultural shifts were slow to be adopted and established patterns of behavior were continued with some tenacity. Cultural reasons

for this apparent reticence may well stem from the richness of the natural biota whereby basic hunting, collecting, fishing, and foraging economic activities provided a plentiful and stable food base. Radical cultural shifts may have been resisted as they would have been disruptive to the efficient and well conceived adaptive modes then existent.

Kinds of Archaeological Sites

The most common archaeological sites in the survey area are middens which are concentrations of various kinds of refuse built up over a period of years and represents the collected garbage of the prehistoric occupants of the site. For most of the phases in Louisiana Prehistory, it is believed that the Indians lived on top of the aggrading refuse piles, discarding their waste where it was used. Middens therefore, also represent habitation sites in most cases. They often contain burials that may or may not have attendant grave goods. In Southeastern Louisiana, two molluscan species were heavily exploited and their shells are the predominant constituent in the composition of local middens. These are the oyster and the brackish water clam, *Rangia cuneata*. Oysters were the staple of the Archaic period while the later, ceramic making peoples shifted to a heavy dependence on *Rangia*.

A very common site type in the Pontchartrain Basin is referred to as a beach deposit. This is generally an inundated shell midden partially or completely destroyed by wave action located on a present beach and characterized by water tumbled artifacts and disturbed surfaces. It is suspected that, given areal subsidence, many beach deposits may still have considerable subsurface, hence underwater, remains.

Relatively rare in Southeast Louisiana is the site type referred to as an earthmound. These mounds of varying sizes and heights are intentionally created elevated areas that serve as special burial tumuli, foundations for special structures, or both. Earth mounds generally have midden deposits near them.

Rarely found, but probably quite common sites, are the remains of short occupation campsites. These sites are small and are characterized by a very limited artifact assemblage thinly scattered over the surface.

Recently collected data suggests that many midden sites may represent special collection stations and are not the remains of actual settlements. If this preliminary interpretation of these data is correct, the preservation of all remaining archaeological sites, no matter how insignificant in surface appearance, becomes

critically important until systematic excavation can be affected if we are ever to completely understand the full scope of the pre-historic Indian adjustment to the varied and rich environments of southeast Louisiana.

Summary of Archaeological Sites

In Louisiana, archaeological sites are designated and identified by a site number given in accordance with the Smithsonian River Basin Survey system. Under this system, each state is given an initial number; Louisiana is 16, thence each county (parish) gives a letter abbreviation; Orleans is OR, thence each site is numbered in order of its discovery or recording. Thus, 16 OR 6 is the designation of the sixth site recorded in Orleans Parish, Louisiana. Often, especially in an area of burgeoning development such as Orleans Parish, a site may be recorded for Orleans Parish. There were a series of shell mounds scattered south of Lake Pontchartrain in what is now the Lake Forest area and known collectively as the Little Woods sites.

Because of this destruction of archaeological sites, the following summary has several numerical gaps which represent sites which no longer exist but which were recorded prior to their destruction.

16 OR 6 - Big Oak Island

A major and often visited shell midden now located in the heart of the proposed Pontchartrain New Town development. Site has been investigated on several occasions and Radiocarbon dates from 520 B. C. at the base to 95 B. C. near the top. Cultural actions are Tchefuncte and Marksville.

16 OR 7 - Little Oak Island

A major and often visited shell midden now located in the heart of the proposed Pontchartrain New Town development. This site is slated for intensive investigation if funds become available. It should be of extreme value in the reconstruction of the Tchefuncte and Marksville culture periods.

16 OR 9 - St. Charles Canal

Shell midden probably destroyed. Not visited by this writer.

16 OR 11 - Dwyer Canal

Dredged shell midden possibly mostly covered by marsh. Cultural association unknown; not visited by this writer.

16 OR 12 - South Point

Partially destroyed shell midden of Coles Creek and Historic affinities. Greater portion of midden probably lies beneath the water table and under RR rocks.

16 OR 13 - Unnamed eroded shell midden

Eroding shell midden with probable subsurface manifestation.

16 OR 14 - Lake St. Catherine

Eroding shell midden on south shore of Lake St. Catherine 500 feet southwest of Miller Bayou. A large quantity of artifacts covering the surface ranging from Coles Creek through Historic.

16 OR 15 - Paris Road

Shell midden $\frac{1}{4}$ mile west of Paris Road at edge of Hayne Blvd. Hayne Boulevard covers much of site. Unknown cultural affinities and not visited by this writer.

16 OR 16 - Rabbit Island

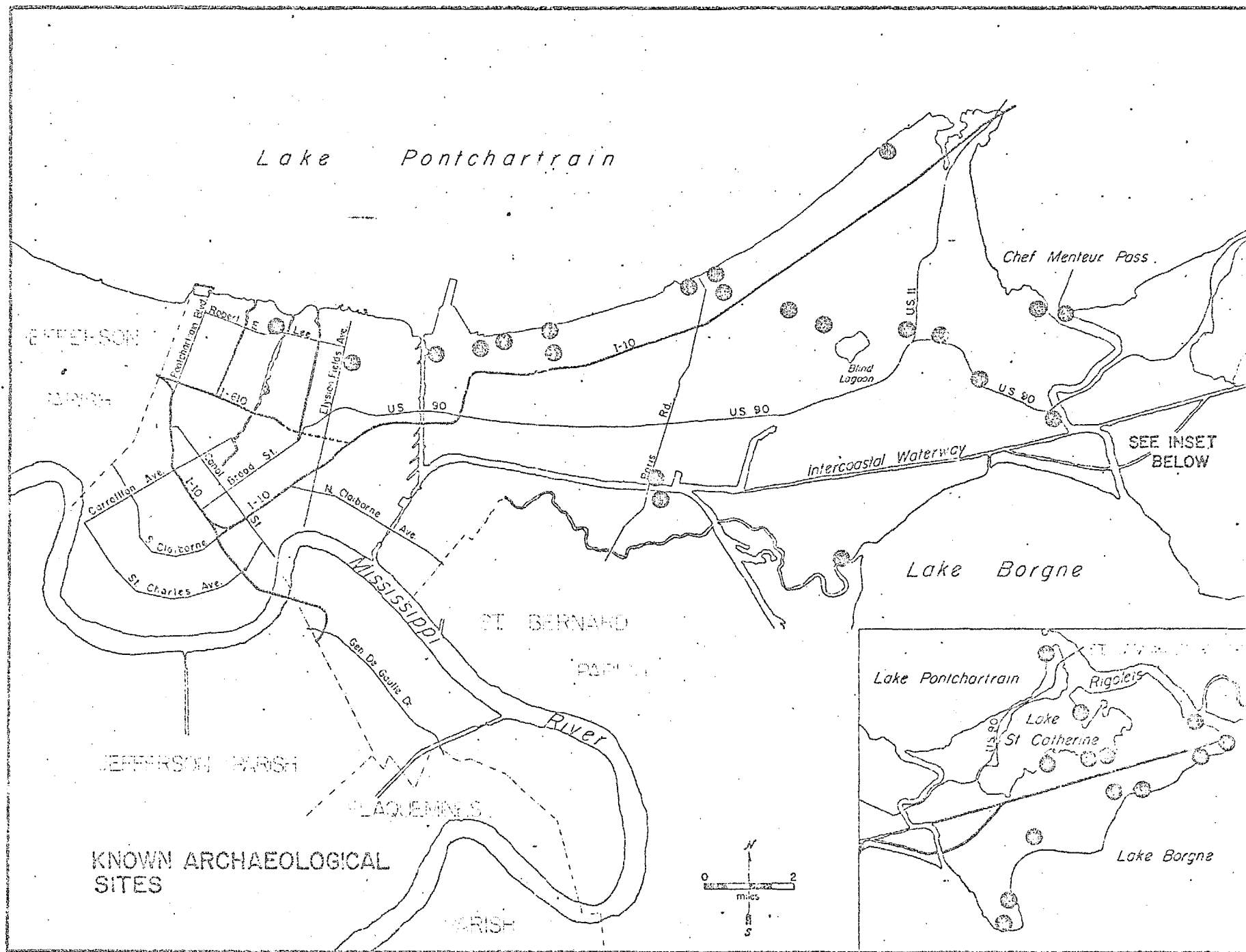
Partially destroyed large shell midden on the south bank of the Rigolets directly opposite the west mouth of the West Pearl River. Collections made at various times indicate cultural sequence from Tchefuncte through Historic.

16 OR 17 - Bayou Platte

Conical earth mound on E. Bank of Bayou Platte about $2\frac{1}{2}$ miles NW of Alligator Point. Cultural affiliations unknown and not visited by this writer. Note: This is the only earthmound recorded for Orleans Parish.

16 OR 18 - Alligator Point

An eroded midden or beach deposit about 1-1/3 miles northwest of Alligator Point on the shore of Lake Borgne about $\frac{1}{4}$ of the distance around Alligator Bend. Not visited by this writer.



16 OR 19 - Spanish Fort

Multicomponent site with ruined fort lying situate on or near a buried shell midden on the west bank of Bayou St. John, north of the intersection of Robert E. Lee and Wisner Boulevard.

16 OR 20 - Citrus Canal

A buried, probably destroyed shell midden reported during the construction of the Citrus Canal Pumping Station. Not visited by this writer.

16 OR 21 - Truloix Bayou

A large dredged shell midden near the shore of Lake St. Catherine and south of Truloix Bayou. Most of site destroyed by dredging, all remaining on surface is a peripheral spoil bank. Probable cultural affiliation is Coles Creek.

16 OR 22 - Ideal Camp

A small Tchefuncte midden between Miller Bayou and Frederic Bayou about 1000' south of Lake St. Catherine.

16 OR 23 - Bayou Bienvenue

Tchefuncte Shell midden located on the north bank of Bayou Bienvenue about $\frac{1}{2}$ mile from Lake Borgne. This site is reported to be in a fair state of preservation.

16 OR 24 - Sea Brook

Destroyed or buried shell middens extending along the old lake shore at the New Orleans Municipal Airport.

16 OR 26 - Little Woods

Buried or destroyed shell midden 800' SE of the Citrus Canal Pumping Station. Not visited by this writer.

16 OR 28 - Haughs Canal

Destroyed or buried site about 300 yards east of the junction of Paris Road and Hayne Boulevard. Not visited by this writer.

16 OR 29 - Chef Menteur

Tchefuncte midden in good preservation although considerably subsided, located on the western bank of the mouth of Chef Menteur Pass at Lake Pontchartrain.

16 OR 30 - Chef Menteur Pass

An eroded, virtually submerged midden located on the east bank of Chef Menteur Pass at Lake Pontchartrain.

16 OR 31 - Bay Jaune

A small Coles Creek midden located on the shore of Lake St. Catherine about $\frac{1}{4}$ mile northwest of Bay Jaune Point. Site is eroded and mostly submerged.

16 OR 32 - Ft. Macomb

Historic Fort Macomb built on top of a shell midden on the west bank of Chef Menteur Pass.

16 OR 33 - Alligator Point

A shell ring about $\frac{1}{3}$ of a mile N of the south edge of Alligator Point. This is the only shell ring reported for Louisiana and as such is extremely important. Not visited by this writer.

16 OR 34 - Garcia Site

An eroded beach deposit on the east shore of Lake Pontchartrain about $\frac{3}{4}$ miles west of Ft. Pike. Paleo Indian or Archaic projectile points have been found on this site which makes it the oldest site in Orleans Parish.

16 OR 37 - De Montluzin Camp

Mostly destroyed midden on the south bank of Bayou Sauvage. Site area affected by camp construction and the construction of Highway 90.

16 OR 38 - Orleans Protection Levee

A site of unknown nature. Artifacts found on spoil bank on the north bank of Bayou Sauvage just east of the Orleans Protection Levee.

16 OR 39 - Turtle Bayou

A small shell midden reported to be 50 feet west of Highway 11 and 3/4 mile north of junction Highway 11 and Highway 90. Site not visited by this writer.

16 OR 40 - Linsley Site

This is a totally submerged midden discovered during the dredging of the Intracoastal Waterway. Radiocarbon dates range between 1900 and 2100 B. C. Artifactual assemblage includes numerous Poverty Point Objects. Not visited by this writer.

16 OR 41 - Paris Road

A dredged Tchefuncte midden uncovered during dragline operations in conjunction with the construction of the Paris Road Intracoastal Water Bridge. Not visited by this writer.

New Site - Not yet numbered - Catfish Point

An eroded midden recently exposed by wave action located on Catfish Point at the juncture of the Rigolets and Lake Borgne. Material collected ranges from Tchefuncte through Historic.

New Site - Not yet numbered - Big Deedie Lake Site

A small conical shell midden with Tchefuncte material located about 200 meters north of Lake Borgne and about 600 meters south of Big Deedie Lake.

New Site - Not yet numbered - Deedie Bayou Site

An eroded shell beach 100 meters east of the mouth of Deedie Bayou and Lake Borgne. Cultural material not identified.

Conclusion and Recommendations

The foregoing list of archaeological sites has been developed by relatively non-systematic reconnaissances by various workers between 1960 and 1970. Orleans Parish has not received a thorough section by section archaeological survey using the full battery of modern investigative techniques including aerial photography, infrared remote sensing, and patient, complete traversing of the whole parish. For instance, it will be noted that Orleans Parish has no sites recorded on the West Bank. The probable reason for this is that no one has looked for them there. Many of the known

sites are either destroyed or endangered by urban sprawl or erosion due to natural subsidence. It is strongly recommended that a complete and comprehensive survey be undertaken to evaluate the actual state of the archaeological potential of the Parish.

Summary

The prehistory of the New Orleans area should be considered as an important cultural element. Many of the known archaeological sites in the City of New Orleans are of considerable value not only to the city and state, but also to the United States as a whole. Additional sites will undoubtedly be discovered in the future, thus adding to the body of existing knowledge of the prehistoric cultures once inhabiting Orleans Parish.

The City's archaeological sites should be preserved, not only for their own sake, but also because they are of value as tourist attractions, and as educational resources. Most of the known archaeological sites in Orleans Parish are located on ridges in the undeveloped wetlands areas of the city. Many sites probably exist in developed areas, however they are now inaccessible. The archaeological sites in Orleans Parish could fall under the protection of either a state, or a national landmarks commission. There are two sites presently on the National Register of Historic Places and Sites (Little and Big Oak Islands). The City of New Orleans supported the State Legislation (State Act 268) for the creation of a Landmarks Commission and is presently at work on its local implementation. Should other sites be determined to be outstanding and of local significance, then this commission could protect them through legislative and police action. With continued development taking place in many of the areas where these sites are located, landmarks designation and protection is necessary and essential.

In 1717 John Law received a royal patent to Louisiana to be operated as a colonization company, and named Jean Baptiste Le Moyne, Sieur de Bienville to found his dream city on the Mississippi. The exact date of the founding of New Orleans, named in honor of the Prince Regent of France, Philippe, Duke of Orleans, has been disputed though most historians agree upon the year 1718. At that time in February, Bienville entrusted his engineers with the plotting of the town, the exact location of which corresponds to the French Quarter of today.

Bienville's selection of a site had been subject to criticism almost from the beginning principally because of its low swampy character and its distance from the mouth of the Mississippi. Presumably this particular site was selected because it provided an inland water route to the Gulf Coast settlement at Biloxi through Bayou St. John, Lake Pontchartrain and a series of lakes and bayous which link the lake to the Gulf. No doubt Bienville was also influenced to a lesser degree by the splendid crescent bend in the river which has ever since caused New Orleans to be known as the "Crescent City". From this commanding position, the river was visible both up and down for a considerable distance. Although the French Court originally favored a more eastern settlement, in 1722 Bienville obtained official sanction for making the new site the capitol of Law's Colony.

The Isle de Orleans was a largely roughly triangular semi-marshland bounded by the Iberville (Mississippi) River, Lakes Maurepas and Pontchartrain on the north, the Gulf of Mexico on the east and the mouth of the Mississippi on the south. This area of marshes, rivers and bayous was rich in alluvial soil deposits which provided fertile farmland. Moreover, the site chosen by Bienville was a port with two waterfronts. Natural resources thus combined with location to make New Orleans an area encouraging to development.

The unique features of the New Orleans environment limited the first urban settlements to the elevated perimeters of the basin. The earliest known plan of New Orleans, dated in Biloxi on April 23, 1722 extended for nine blocks along the river and six in depth with the Plaza d' Armes in the center facing the river. The land around the Plaza d' Armes was reserved for public and religious buildings and retained this designation throughout the French Colonial period.

The population which first formed the initial settlement of New Orleans was comprised of different races, creeds, nationalities and personal backgrounds. After a period of frontier hardship, the settlers began to be molded into a quite distinctive and homogenous group. The French government followed a very

liberal policy of land grants to individuals with the result that most of the early settlers became big land owners, a policy that was also continued by the Spanish government. Thus under both France and Spain there was a tendency for government officials and military personnel sent out to the colony to acquire sizeable land holdings without having to purchase them. On these holdings the French established plantations worked with slave labor and rapidly attained property on this basis. However, most of them continued to live in the city particularly during the winter.

Life in the city as well as on the plantation was based on slave labor and the labor of free Negroes who comprised a large portion of the population, and increased steadily throughout the colonial period. Thus by the time of the Louisiana Purchase there were twice as many Negroes as Whites in the city.

In 1762, by the Treaty of Fontainebleau, Louis XV ceded New Orleans along with the portion of Louisiana lying west of the Mississippi River to Spain. But it was not until 1764 that French officials were informed of the transaction and instructed to relinquish the colony. For more than two years the city remained abandoned by France and unclaimed by Spain. It was not until 1769 that a change in government was made with the arrival of Governor O'Reilly who took possession of Louisiana in the name of the King of Spain. The superior council of the French regime was replaced by a legislative and quasi-administrative council called the Cabildo.

Under Spanish rule, few changes occurred in the city plan and they made no attempt to colonize New Orleans. Even the elegant social life of the city remained as it had been under French rule and Spanish officials and military men seemed to have found colonial life much to their taste and for the most part were accepted into the social life. Many of the Spanish married local residents, received land grants, established plantations and became part of the colonial landed aristocracy. Thus, Spanish rule does not seem to have altered life in any significant way.

New Orleans assumed a degree of prosperity and general well being under Spanish rule that had not been found under French rule. The commerce of the colony was relieved to some extent by the lessening of the stringent trade regulations of the French. The population of the province had more than tripled and that of New Orleans had almost doubled. New Orleans had assumed the semblance of a bustling city, but its physical aspect was still that of a dirty, poorly built frontier settlement.

On March 21, 1780, a great conflagration occurred which destroyed nearly the entire city. The city was rebuilt generally in the same French manner and with the same sort of combustible material. In December of 1794 a second disastrous conflagration devastated New Orleans before the town had fully recovered from the effects of the earlier fire. The rebuilding of the City was begun immediately.

During the period between the two fires, the town began to expand beyond the fortifications although there were still a number of undeveloped squares around the fringe area within the city walls. In 1788, a plan was drawn up for the subdivision of the plantation of Gravier on the upper side of town. This new subdivision, the first in New Orleans, was called the Faubourg Ste. Marie and the streets were laid out and named essentially as they are today. Another important development during the Spanish period was the building of markets and during this period workmen began the construction of the famous "French Market" which is Spanish from foundation to chimney-pots.

Toward the end of the Spanish period, Americans from Tennessee and Kentucky had begun to move into the city. On November 30, 1803, the formal retrocession from Spain to France took place on the Plaza de Armas and 20 days later, on December 20th the flag of the United States was raised over New Orleans. With the Louisiana Purchase there was a rapid increase in the population. This rapid immigration of Americans caused the Faubourg Ste. Marie to grow rapidly and expand the region's urbanized development and by 1810 this area had become the American sector of the city.

Soon after the Americans took possession all the fortifications were removed and broad tree-lined boulevards, Canal, Rampart, and Esplanade, replaced them and all the streets of the Vieux Carre were extended across the former commons (now Common Street) to connect with the streets of the American sector. The City began to expand in all directions with subdivision of the Marigny Plantation just beyond the lower fortification and the Tremé Plantation beyond Rampart Street.

The incoming Americans were a sharp contrast to the existing genre. Thus, as it reached New Orleans the spreading American Frontier ran into a culture which, on the basis of manners and fine appearance at least, was more continental than its own; the only case in American History. The New Orleans continental's values were in the family tradition of inherited wealth, leisure and social position; whereas, the Americans' ideal was the self-made man. The Europeans were Catholic and the Americans Protestant. The

difference in language aggravated the conflict. An adjustment to their perspective problems was a physical separation of the two groups; the Americans going to live in the uptown section of New Orleans and the locals remaining in the old, downtown section.

The strife which produced this residential segregation was manifest to severe degree in political circles. The locals, considering themselves the settlers of Louisiana, felt the government belonged to them, and the Americans, considering that they had purchased Louisiana, felt the government was theirs. The Europeans had been accustomed to using government positions to support their sons who could not inherit land under primogeniture, and the Americans had no inclination to use tax funds to support European families. In contrast the Americans wanted the government to build various and extensive facilities which would be of aid to commerce, while the Europeans were not receptive to being taxed to bring prosperity to the Americans.

During the transition years as New Orleans took on more of an American character an unusual increase took place in the size of the batture as the river bank had within a comparatively few years moved out several hundred yards. With this increase in the batture new commercial developments began to take place along the riverfront. Old houses facing the river gave way to commercial structures.

About this time there was also a gradual movement of business towards Canal Street and the commercial and retail center shifted from Chartres and Royal Streets to Canal and the American sector above. This movement away from the traditional center of the city, was counteracted by the other leaders of the community who organized the New Orleans Improvement Company.

As the rivalries increased, the very government of the city was torn asunder. The differences became so great that as the two factions attained near equality numerically and financially, one government could no longer contain them. Thus in 1836, New Orleans was divided into three municipalities having one mayor, but for all practical purposes having separate governments. In the center was the old city bounded on the east by Esplanade Avenue and on the west by Canal Street. To the east of it was the immigrant truck-gardening city, and to the west of the original section was the American municipality. In all three cases the river was the southern boundary and Lake Pontchartrain was the northern boundary. During this period, it became a matter of honor and of loyalty to one's cause to live on the proper side of these streets (Canal Street and Esplanade Avenue), and those who moved into another section were viewed askance if not actually as deserters.

A Peep of the River, and
the Suburbs, which to-day constitute

With the division the American municipality launched an almost extravagant program of improvements. Old wharves were improved and new ones were built, streets were paved, public schools were developed and public buildings were constructed. Accompanying this was a growing prosperity and a rapid inflow of white population. The increase in population created a need for laborers which was supplied by incoming immigrants from Europe. The mounting wealth of the Americans enabled them to move farther uptown and build more impressive homes which equalled or surpassed anything that had previously existed.

The influx of immigrant labor created a need for housing which pushed back for the most part the fringe of development.

Due to administrative and financial difficulties, the three municipalities were recombined into one in 1855, but by that time the ecological pattern was firmly fixed.

As the population increased the need for new homesteads manifested itself in a spreading out of the original districts. Because of the swampy condition of the land, expansion had to go in a long, narrow line which finally increased the distance to the Central Business District to an intolerable point. To overcome this problem expansion occurred through the use of minimum size lots which resulted in inconveniently small yards and very high land values.

It was not until the improved drainage of the early 1900's and the invention of the automobile that the decentralization and expansion of the population became evident in the New Orleans region. The trend of population today continues in an outward direction. This dispersal of the population has resulted in a greater economic segregation of the population, a trend experienced in other large metropolitan areas. As the low income area of the central city expands, so does the suburban migration of the middle and upper class resident.

While the economy of the region is shaped by the land and people, it in turn has become a factor influencing the physical environment and activities of the population. During this early period the economy of New Orleans was largely agricultural, but as trade, transportation, manufacturing and services became major components of the economy the importance of agriculture declined steadily.

Americanization brought not only unrestricted trade, but also the improvement of trade routes. The port has always been the region's major economic activity and today it is the second ranking

port in the world with port activities accounting directly or indirectly for nearly half of the jobs in the metropolitan area.

The cultural history of the city has played a significant role in determining man's reaction to his natural environment. New Orleanians have traditionally sought to reap from the marshes and waterways many food products which collectively have become known as New Orleans cuisine, and to rely upon the estuaries for recreational pursuit. However, at the same time, New Orleanians have sought to drain and fill these same marshes which have given the city its distinctive life styles. By understanding man's activities in relation to the environment, a more harmonious balance can be achieved which allows expansion without destroying those factors necessary for the preservation of the New Orleans life style.

Efforts have begun to preserve the physical manifestations of the city's past. New zoning categories have and are being implemented to create special districts including historic districts. By combining these efforts with coastal zone management techniques the best of New Orleans' traditions and lifestyles can be preserved for future generations.

6 Demographic Summary

The City Planning Commission of New Orleans has subdivided Orleans Parish into Planning Sections and Planning Units for the purpose of statistical summarization and small area analysis. The Commission reasoned that Census Tracts were not suitable in most cases for area planning and statistical summarization and that the city could be divided into more logical sub-areas on the basis of population numbers and types and homogeneity of land uses for comprehensive planning purposes. Planning Sections, as established by the Commission, total nineteen with these broken down into varying numbers of Planning Units each defined principally by existing land uses.

This section examines on a Planning Section basis only, the changes in the components of population and housing. Maps defining boundaries of sections on a street base, are included. Graphs are presented from available information at the time of this publication which could be compared to similar data in 1960. The maps and graphs are followed by a written discussion.

The analyses describing each planning section are studies based upon the graphs, tables and charts that precede the text. After much examination of the data, certain patterns arise that help to give an area a characteristic description which is usually based upon various levels of "stability" or "instability". To define an area in these terms is very difficult for a planning unit and especially for a planning section which is a much larger area composed of a variety of complex variables including such factors as land use, percentage of ownership and renter occupied units, vacancy rates, inward and outward movements of whites and non-whites of various social and economic classes, age of housing, and the perceived as well as real changes in property values which result from the interaction of these characteristics.

However, one can describe certain factors that appear to generate a relatively "stable" area. Usually, neighborhoods of predominately single family units with people of similar socio-economic background lead toward more "stable" areas. The percentage of renter occupied units will usually influence stability of a neighborhood because of the transient nature of apartment tenants as opposed to homeowners who usually have a long term investment in their property and remain there.

Racial and socio-economic change also contribute to an increase in instability. It is important to note that a complicated pattern usually develops as the result of an in-migration of both blacks and whites into a neighborhood. Often new residents are from a somewhat lower economic class than those residents previously residing in an area. These changes can all have an effect

upon the values of housing.

All of these factors interact to produce the changes that are revealed in the tables, charts, graphs, etc. It is also important to note that the Planning Section is a composite of numerous neighborhoods where these factors interact with one another and between neighborhoods. Thus, a variety of changes is compressed into a relatively small set of statistics about a large and diversified area. It is hoped that the planning unit studies will help to identify some of the more particular changes occurring within sections. It should also be understood that these analyses are principally descriptive rather than analytical.

Therefore, in reviewing analyses in this report, summaries about overall condition of an area will center upon "stability" and the factors that help to determine it.

Special Notes:

Information about group quarters and number of units with 1.01 or more person per room is presented, but comments made only for particular situations. Group quarters consist of institutions such as mental hospitals, homes for the aged, prisons, dormitories, military barracks or any house, or apartment with five or more occupants unrelated to the head of the household. Specific planning sections that reveal substantial changes in this indicator are discussed including probable reasons for that change.

Statistics pertaining to the number of units with 1.01 or more persons per room can give an indication of the overcrowding of a section. This data is obtained by reclassifying occupied housing units by the number of persons per room which is calculated by dividing the number of persons by the number of rooms in each unit. However, information about this factor on a Section basis in virtually all cases show either decline or no change primarily because there was a general loss of population in the city except in some newer sections of the city such as Edgelake and East Gentilly. This does not mean that New Orleans has no overcrowding problem but, rather, that high levels of density can be disguised by the large size of the section and the overall population loss in the city. It is hoped that a future study of planning units will isolate particular areas of overcrowding utilizing the number of persons per room as an indicator. However, a discussion of each planning section relating to this data is not made.

Interpretation of the Graphs

All graphs are presented on a percentage basis with some net

numerical information provided for several items. To understand a particular item such as change in the age group 30-49, one should refer to the line along the vertical axis for each census year and measure the change in the length of that line from 1950 to 1970 in terms of its percentage span. For example, the Lakeview Planning Section for the age group 30-49 indicates that in 1950 approximately 34% of the population in the area was included within this age group. By 1970, the percentage had declined to about 23%. Therefore, one should measure the length of the line along the vertical axis and not the location of a particular item along the percentage scale.

Interpretation of Numerical Information

1970 census data for planning sections and planning units was determined by aggregating 1970 census block data. Because of the Census Bureau's policy of suppression (the exclusion from public release of certain data items which might violate the confidentiality of census information), the resultant planning section and planning unit totals were on the average one to two percent less than their "true" value. Attempts to adjust the suppressed data proved incomplete in that some universe totals do not equal the sum of their component totals. The resultant lack of exactness is unavoidable; however, it is felt that the data as presented is valid for descriptive purposes.

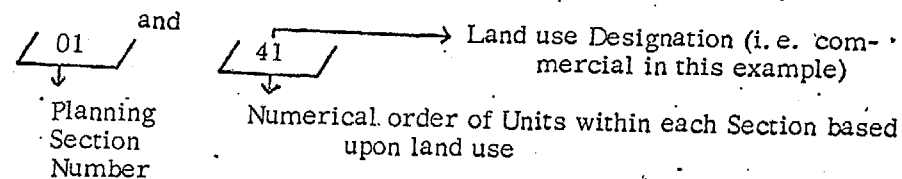
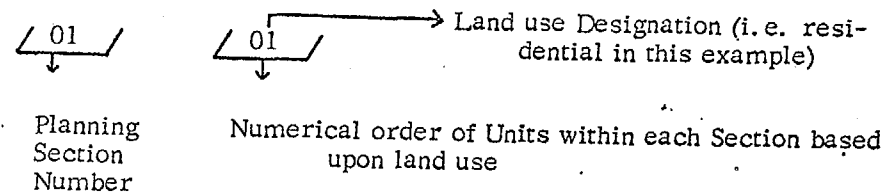
A similar problem developed for several isolated cases from available 1960 census data. If any component totals do not yield the universe total, the rounding of the subtotals was the reason for the discrepancy. Usually, any factor of error in 1960 was extremely small (less than five units) and of no consequence in interpretation.

Development of the Planning Section and Planning Unit

New Orleans was divided into nineteen Planning Sections. Each section was then divided into Planning Units. The first digit of each Planning Unit indicates the predominant land use while the second digit indicates the numerical order of the units within each section according to land use. Land use digit designations are as follows:

- 0 and 1 = Residential
- 4 = Commercial
- 6 and 7 = Industrial
- 8 = Public and Semi Public

Therefore, Planning Units 0101 and 0141 may be described as:



Summary of Planning Section Names and Numbers

The names and numbers designated for the areas of New Orleans are listed below:

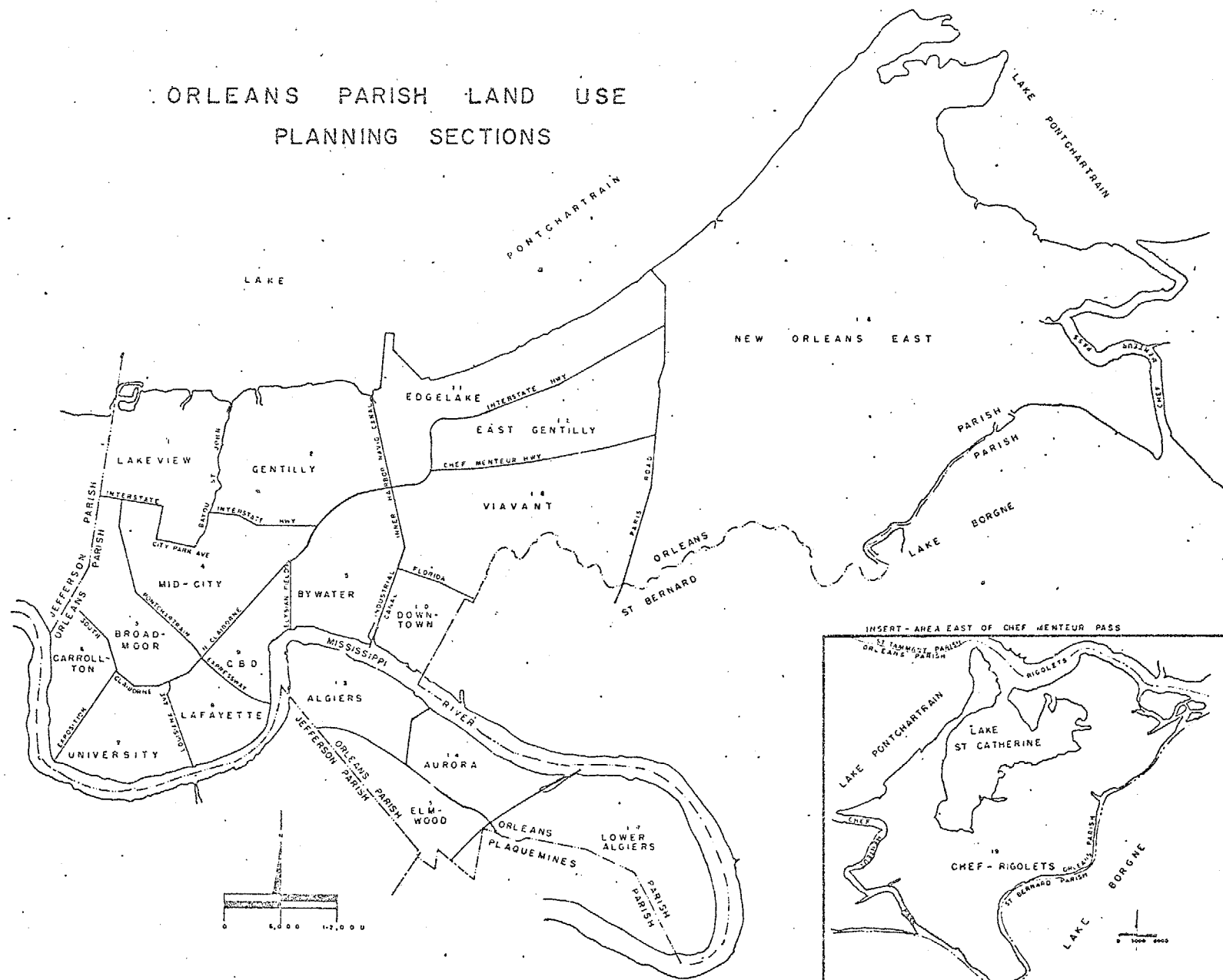
Number	Name	Number	Name
1	Lakeview	10	Downtown
2	Gentilly	11	Edgelake
3	Broadmoor	12	East Gentilly
4	Mid-City	13	Algiers
5	By Water	14	Aurora
6	Carrollton	15	Elmwood
7	University	16	New Orleans East
8	Lafayette	17	Lower Algiers
9	Central Business District	18	Viavahn
		19	Chef-Rigolers

Summary of Rent and Value Categories

	Rent		Value
Lower:	Under \$60	Lower:	Under \$10,000
Lower Middle:	\$60-\$79	Lower Middle:	\$10,000 to \$14,999
Upper Middle:	\$80-\$99	Upper Middle:	\$15,000 to \$24,999
Upper:	\$100 or more	Upper:	\$25,000 and over

(All information for 1960 rent and value is expressed in 1970 dollars)

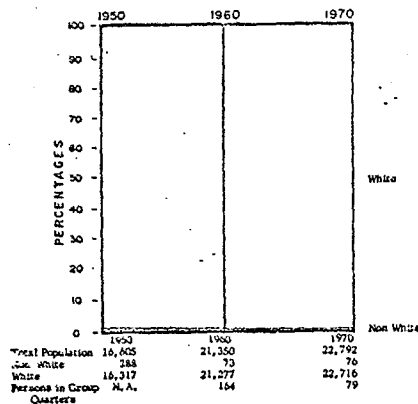
ORLEANS PARISH LAND USE PLANNING SECTIONS



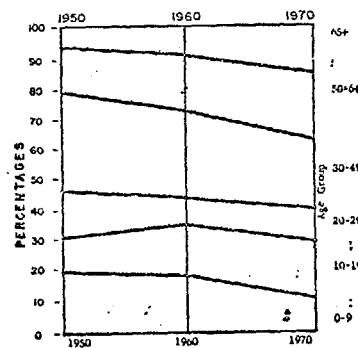
LAKEVIEW PLANNING SECTION I

POPULATION

POPULATION CHANGE BY RACE

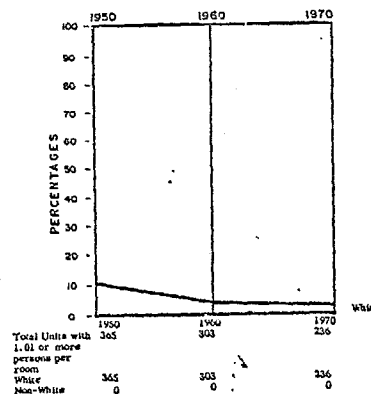


POPULATION AGE GROUP

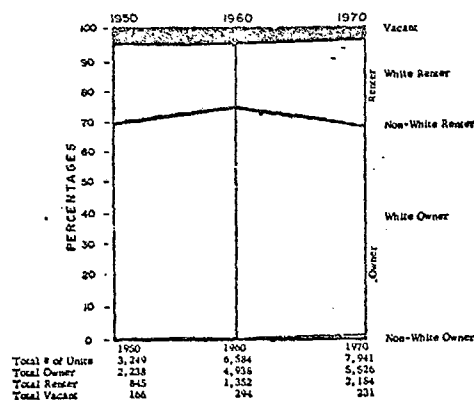


HOUSING

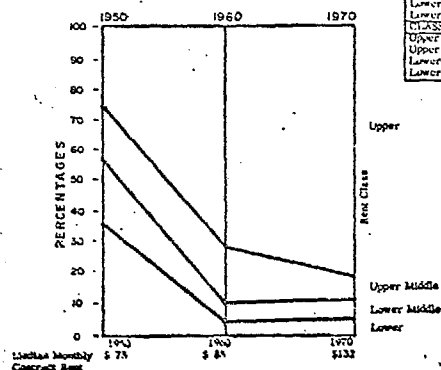
UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE



TENURE

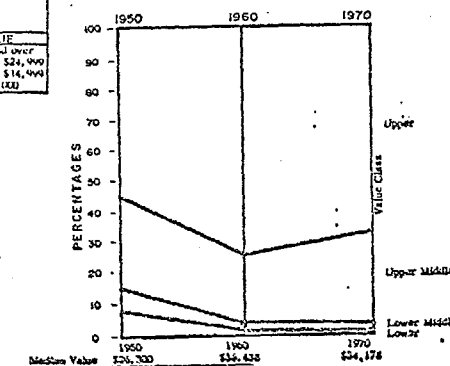


RENT



CLASS	RENT
Upper	\$100 and more
Upper Middle	\$80 - \$99
Lower Middle	\$60 - \$79
Lower	Under \$50
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

VALUE OF UNIT



LAKEVIEW (Planning Section I)

Lakeview may be described as showing relative stability in most of the characteristics measured in this study. Ownership and rentership showed no significant change which is what would be expected in light of small changes in overall population.

Information about tenure is reflective of changes in owner versus renter occupied housing over a twenty year period. The ten years from 1950 to 1960 show the large increase of owner occupied units (over 20% more than the total in 1950) and small increase in rental units. These ten years represent the most productive period in Lakeview's growth in terms of new construction. The following ten year period shows a tendency toward a leveling of owner occupied construction. Vacancy rates show a continuing decline between 1950 and 1970. Therefore, in terms of housing composition one could characterize the 1960-1970 period in Lakeview as a time when housing variety increased considerably and when overall housing activity shifted more toward rental unit occupancy and began to complete its peak period of growth.

Value and monthly contract rent can give some indication of the kind of housing available in the Section. As in all analysis presented herein 1960 dollars are revised to reflect 1970 dollar value. Total number of rental units in the sixties showed the largest increase indicating the growth in rental activity and the percentage of "upper" classified rental units did reveal an increase. This change is probably the result of both building activity and rise in rent of "upper middle" units. Total number of occupied units increased by over 1300. Among the value categories, the number of units classed as "upper middle" increased approximately 4% within that same decline in "upper" classed units.

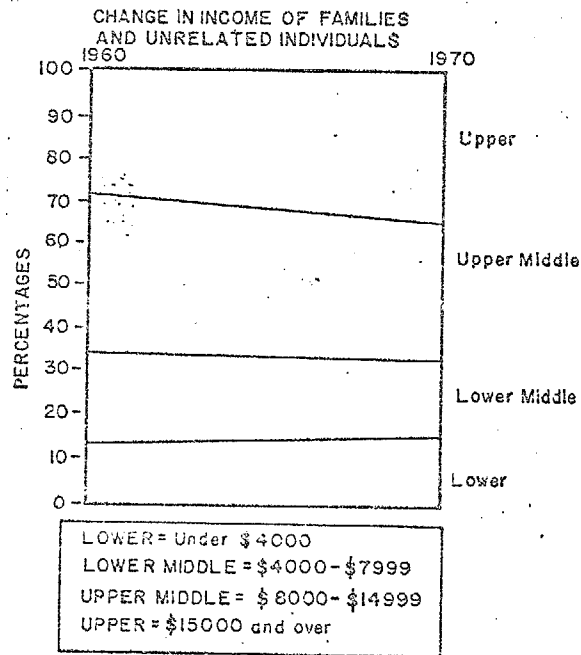
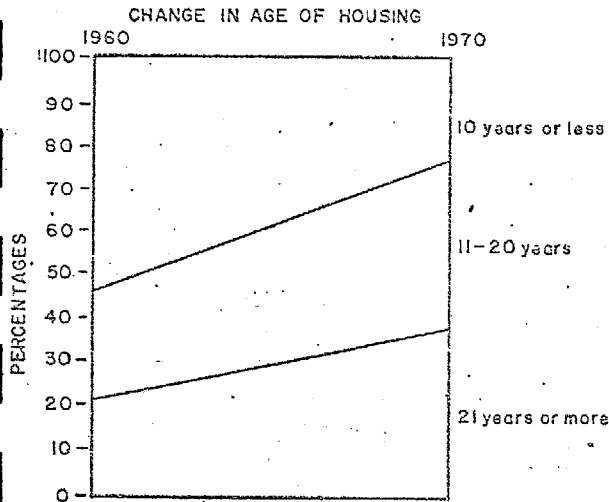
In conjunction with the growth of the Lakeview Planning Section, most of the age categories also experienced a numerical increase. The population increase in the higher age groups is indicative of the trend in New Orleans toward an increase in the population age 65 and over. This group tends to be more permanently located and numerical increases are due primarily to aging of the group aged 50 and over. In this planning section, it would appear that the 50-64 age group is also securely located in that they probably represent the large number of persons whose residency has remained unchanged since their original movement into the Lakeview area.

Two exceptions to the growth in increase occur in the 0-9 and 30-40 age categories. The decline in 1970 of the 0-9 age group

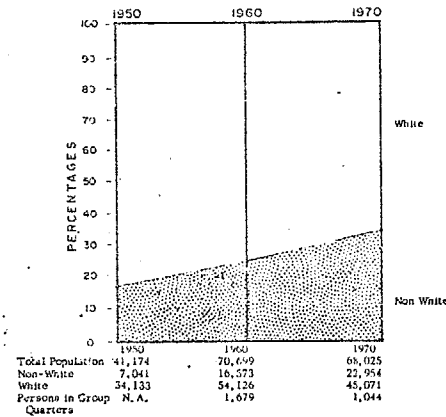
GENTILLY PLANNING SECTION 2

could be a combination of a decrease in the birth rate in New Orleans for 1970 and the fact that many young families have moved from the city. The loss of persons aged 30-49 could be an indication that this group is the most mobile segment of the population as well as having aged 10 years.

LAKEVIEW HOUSING AGE AND INCOME CHANGES

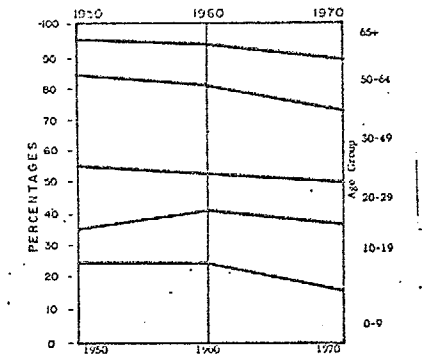


POPULATION CHANGE BY RACE



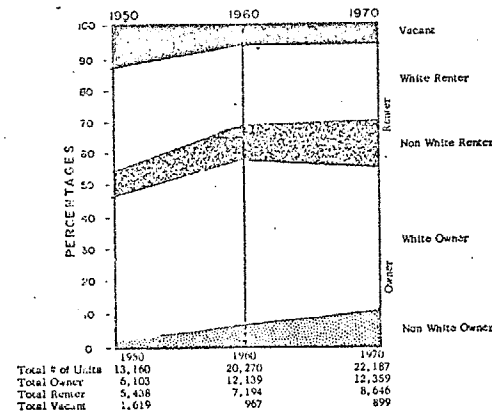
POPULATION

POPULATION AGE GROUP

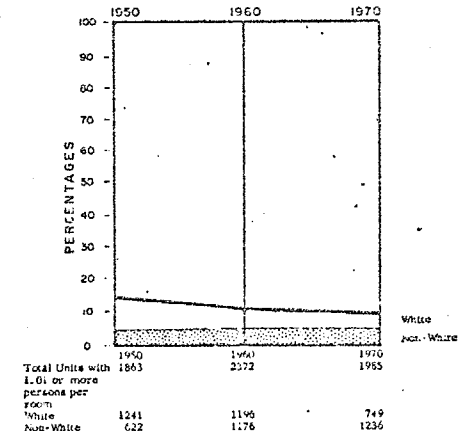


HOUSING

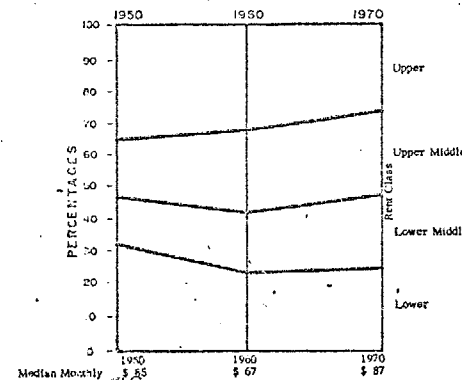
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

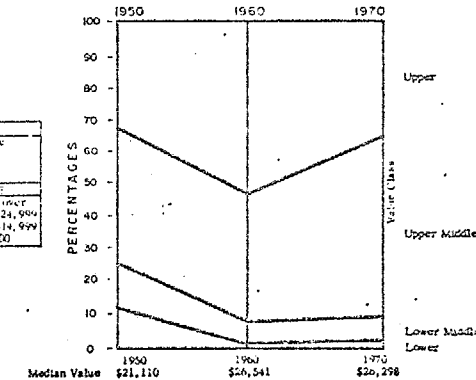


RENT



CLASS	RENT
Upper	\$15,000 and over
Upper Middle	\$80 - \$99
Lower Middle	\$60 - \$79
Lower	Under \$60

VALUE OF UNIT



GENTILLY (Planning Section II)

Indicators in this report reveal that Gentilly is beginning to show signs of a change in its population. The non-white population has increased from one fourth to slightly more than one third of the total number of persons in the Section.

Analysis of tenure from 1950-1970 reveals the tremendous growth in owner-occupied units that occurred during the 1950's. This trend leveled off considerably during the 1960's but renter units increased by 20% for that same period. The percentage of units according to monthly contract rent in all categories increased slightly except the "upper" category but units renting between \$60-\$79 showed an especially large increase.

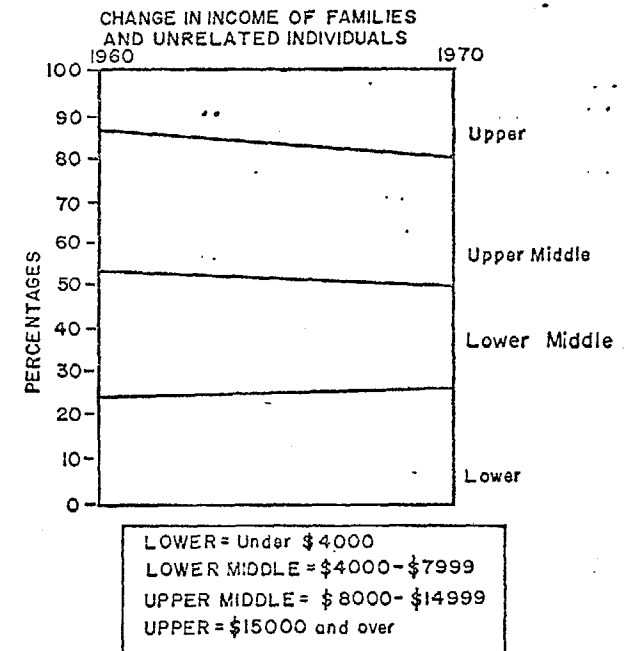
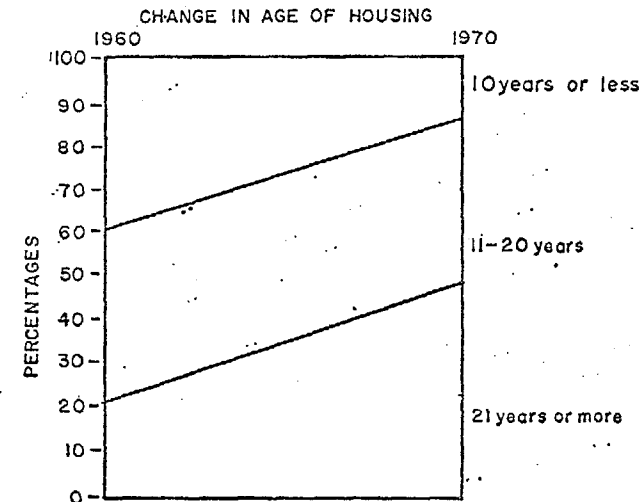
The value of owner occupied units presents a more complicated picture. "Lower middle" units remained stable while "lower" units increased slightly but the net number of units in this rental category is relatively small. (In 1970 only 2.2% of all housing units). The more important changes occurred among the "upper middle" and "upper" classifications. The "upper" category lost approximately the same number of units that the "upper middle" gained. There appears to be an indication of a loss in value among many units that were \$25,000 or more in 1960. Although changes occurred in the "upper" and "upper middle" categories, the overall average value for the Gentilly area remained relatively stable-between \$26,000 to \$27,000. There are indications that in 1970, many of the "upper middle" units were near \$25,000 in value and units classified as "upper" were worth substantially more than \$25,000 to enable the overall average value of an owner occupied unit to remain nearly constant.

Monthly contract rent for Gentilly increased \$20. This value exemplifies the general appreciation in property values and especially those classified "lower middle" during the 1960's. In 1960, this group represented 19.2% of the total number of rented units and in 1970, it represented 23.5% of all rented units.

The Gentilly Planning Section follows a pattern of population change by age group similar to its neighbor, Lakeview, but to a much greater degree. The total population has decreased but this decline was only evident in two age categories: 0-9 and 30-49. The large decline in 1970 in the 0-9 age group would indicate a trend existing in older suburban areas of the movement of young families away from those areas. For 1970, the birth rate for New Orleans declined so the decrease of persons in this age category would correlate with that decline, mobility and aging

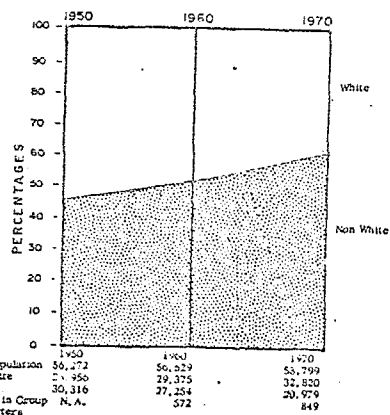
primarily affected the 30-49 age group. The other age group besides these two in this Section have all experienced sizable numerical increases between 1960 and 1970.

GENTILLY HOUSING AND INCOME CHANGES

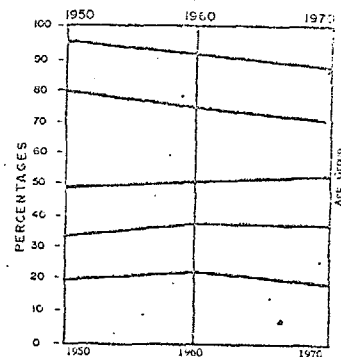


PLANNING SECTION 3

POPULATION

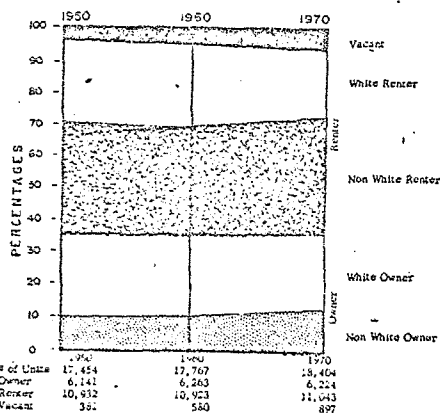


POPULATION AGE GROUP

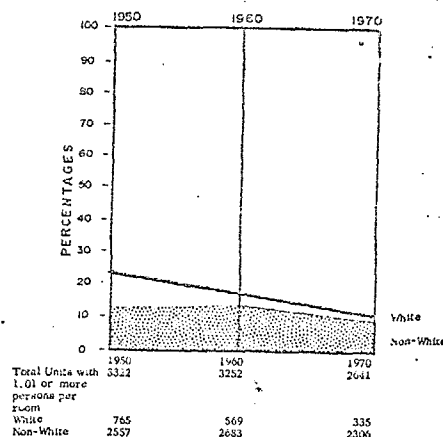


HOUSING

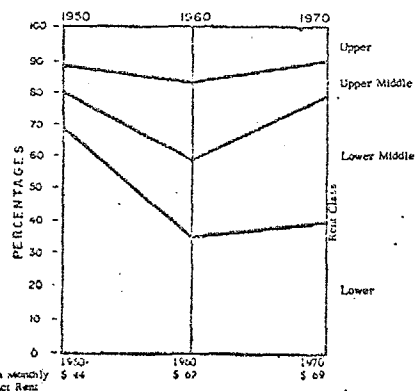
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

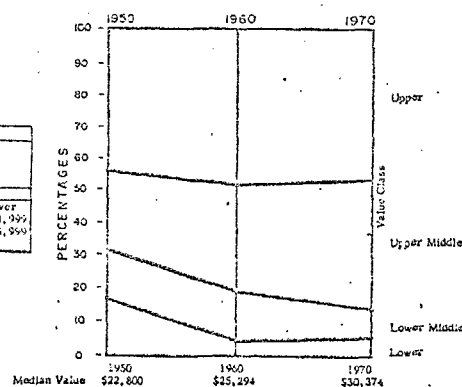


RENT



CLASS	RENT
Upper	\$ 40 and over
Upper Middle	\$ 30 - \$ 39
Lower Middle	\$ 20 - \$ 29
Lower	\$ 10 - \$ 19
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$ 9,999

VALUE OF UNIT



BROADMOOR (Planning Section III)

The Broadmoor Planning Section showed relatively little change among indicators of race and tenure. There was an 8.8% increase in the non-white population in Broadmoor along with an 8.3% decline in units occupied by whites and 7.6% decline in units rented by whites. General statistics about tenure since 1950 revealed little change although the vacancy rate edged slightly upward in 1960 and 1970. The 1970 vacancy rate was 4.9% of the total number of units in Broadmoor.

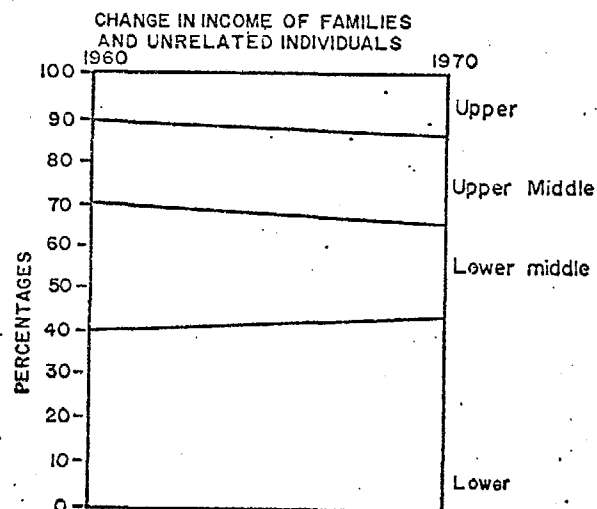
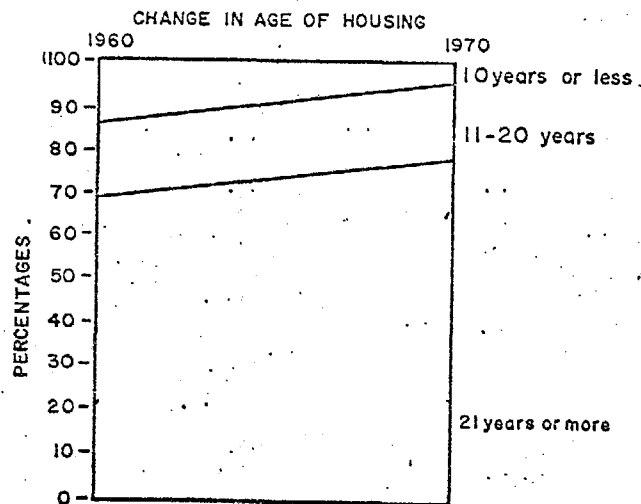
Contrary to the relative stability of the population and the small changes in the value of owner occupied units, monthly contract rent shifted significantly. Notably, the percentage of units renting between \$80-\$99 and \$100 or more declined while the units for under \$60 and between \$60-\$79 increased. Numerically, units from 1960-1970 classified as "lower" and "lower middle" increased but "upper middle" and "upper" classified units declined. One could strongly suggest that these changes are the result of a decline in the condition of the apartments combined with only minimal new construction or renovation in the area as a whole. These changes are probably caused more directly by age of the unit than by any changes occurring within the Section.

Owner occupied units present a different picture in the Broadmoor Section. The number of units above \$25,000 declined negligibly while units classified between \$15,000 and \$24,999 increased. "Lower middle" units declined as some of those units value fell below \$10,000. Average value of owner occupied units for Broadmoor increased by over \$5,000 - probably resulting from increased building activity around New Orleans Country Club and in the vicinity of Academy Drive. Average rental value increased by only \$7.

The Broadmoor Section even though it is experiencing a gradual decrease in total population, had sizable population increases in two age categories, 10-19 and 65 and over. The increase of persons age 10-19 is probably due in part to the World War II baby boom reaching this age group. Also, its close proximity to the universities would indicate substantial numbers of college youth living in rented houses and rooms among the older ages within the 10-19 age category. Increases in the over 65 group are probably more the result of aging from the 50-64 group rather than an actual migration into the area. The 50-64 age group shows signs of stability with only a slight decrease in 1970 due probably to aging or death. The pattern of population decline evident in the 30-49 age group is typical of that of most older areas of the city, which are losing population. The 20-29 age group, also a mobile

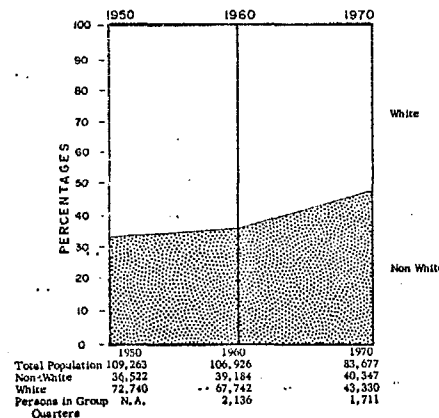
segment of the population, evidenced a sizable decline in 1960 followed by a slight increase in 1970 due probably to an influx of college age persons and young couples. The pattern of the 0-9 age group correlates well with the pattern of birth rates for the city which reflects an increased birth rate during the 1950's followed by a decline during the 1960's.

BROADMOOR HOUSING AGE AND INCOME CHANGES



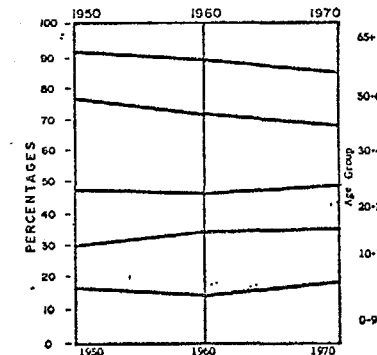
LOWER = Under \$4000
LOWER MIDDLE = \$4000-\$7999
UPPER MIDDLE = \$8000-\$14999
UPPER = \$15000 and over

POPULATION CHANGE BY RACE



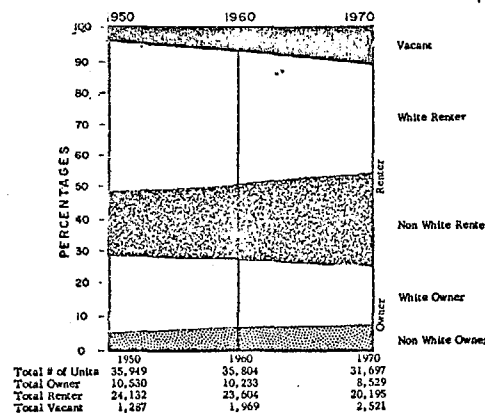
POPULATION

POPULATION AGE GROUP

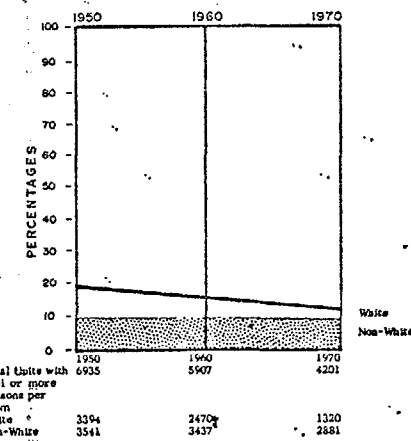


HOUSING

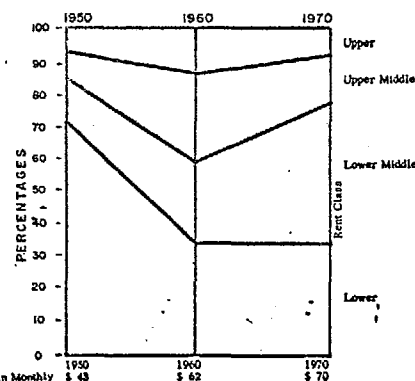
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

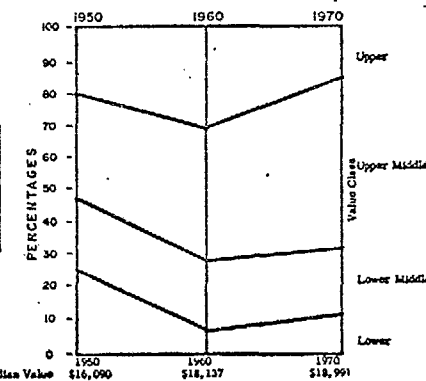


RENT



CLASS	RENT
Upper	\$100 or more
Upper Middle	\$80 - \$99
Lower Middle	\$40 - \$79
Lower	Under \$40
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

VALUE OF UNIT



MID-CITY (Planning Section IV)

The Mid-City Planning Section showed a 3% increase in the population of nonwhites since 1960 resulting in nearly a majority. However, in 1970 the total population had declined 21.7% since 1960. There was approximately an 8.2% decline in owner and renter occupied units but an increase among non-whites in owner and renter occupied units.

Statistics on tenure reveal a declining number of dwelling units and an increasing number of vacancies. The number of renter occupied units declined by 3409 units or by 14% and owner occupied units showed a loss of 1704 units or 17%. Two factors apparently contribute to this situation. One is probably the movement of families from the area while the second is a change in the definition of a housing unit for the 1970 Census. In 1960, piped water was not a requirement in order to be classified as a housing unit assuming no direct access to the unit from the outside or through a common hall. However, in 1970, "complete kitchen facilities" (including piped water) for the occupants exclusive use were required if access to the unit from the outside or through a common hall was not available. Therefore, numerous units classified as housing units in 1960 could no longer be considered units since the definitional standards had been strengthened. In areas of rather substantially poor quality housing such as exist in particular parts of Mid-City, the effect of this definitional change will reduce or essentially exaggerate the decline in the number of units by census definition. Yet those former "units" in 1960 that were "lost" in 1970 still exist and are probably some of the poorer housing in the city. This problem will persist in most of the areas studied in which housing condition is an issue. Thus, one should take both the definitional change and the movement of population into consideration in studying change in tenure.

Accompanying the owner and renter unit change is an increase in the vacancy rate which is characteristic of areas in transition. Vacant units increased by 28% from 1960 to 1970.

Renter occupied units with rents above \$80 showed the biggest loss among all categories. Much of this loss is probably reflected in the increase of units renting for \$60 to \$70. The leveling off in the percentage of units renting for under \$60 is probably caused by the definitional change of a housing unit since most units lacking piped water would have been classified in the lower rent category in 1960. This group might actually have increased if a definitional change had not occurred.

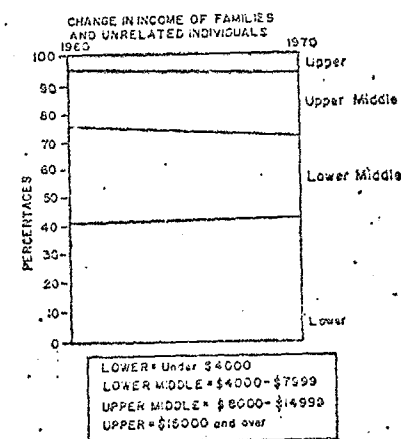
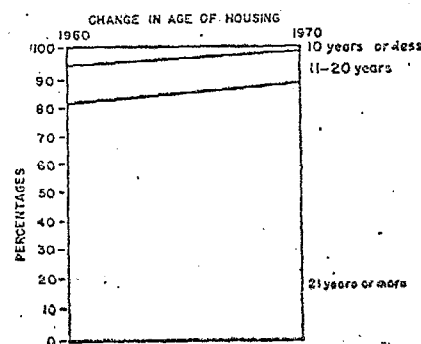
The value of owner occupied units revealed a pattern in which units in the "upper" and "lower middle" value categories declined

considerably. Some of this loss was picked up in the gains among "lower" and "upper middle" groups. However, gains among these two categories were considerably less than the loss of units among "lower middle" and "upper" designations. In addition to the definitional change, another reason for the loss of units especially from the "upper" category of units assuming little new construction in the section was probably the clearance of the right of way for Interstate I-610 requiring relocation of families and demolition.

Both average value of home owned units and monthly contract rent for Mid-City showed slight gains.

Mid-City had experienced a decline in the white population during the 1950's as evidenced by decreases in the 0-9, 20-29 and 30-49 age categories. However, based upon percentage relationships of age groups to total population, gains occurred in the 0-9, 20-29, and 65 and over groups in the 1960's. The overall pattern was more of a black in-migration and a white out-migration. The increase in the 65 and over age category is a continuing indication that this is the portion of the population least able to move from an area. Hence, their increases are due mostly to aging of the over 50 age group.

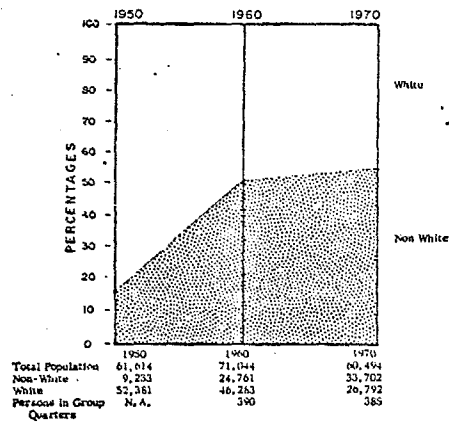
MID CITY HOUSING AGE AND INCOME CHANGES



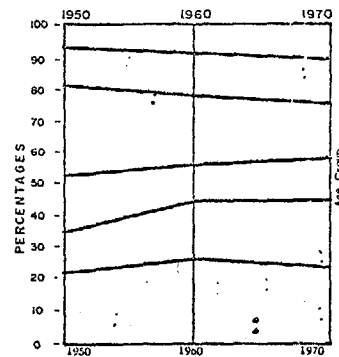
BYWATER
PLANNING SECTION 5

POPULATION

POPULATION CHANGE BY RACE



POPULATION AGE GROUP



BYWATER (Planning Section V)

The Bywater Planning Section experienced a rather small increase in the percentage of the population of non whites from 50.6% in 1960 to 60.5% in 1970. The percentage of owner and renter occupied units declined by 16.7% among owners and 6.4% among renters. Both ownership and number of renter units reduced to combine for a total loss of over 1900 units. Corresponding to these changes was an increase in the number of vacant units by partly related to the construction of Interstate 10 which borders the northwestern part of the Planning Section as well as the expansion of industrial and commercial areas into formerly residential areas. The values and rents present some indication of the nature of this loss.

The vacancy rate showed a substantial increase during the 1960's in comparison to the 1950's.

In 1960 the number of rental units classified "lower" exceeded "lower middle" units followed by "upper middle" and "upper" in decreasing order. The 1970 Census indicated that the gap between "lower middle" and "upper middle" had widened considerably as the number of units renting at or below \$79 increased while units renting at \$80 or above declined.

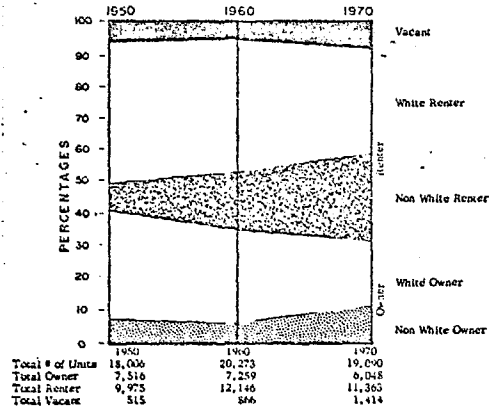
The value of owner occupied housing showed a somewhat characteristic loss among "upper" and "lower middle" units whose values were largely reflected in gains among "lower" and "upper middle" classified units. The loss of 1121 owner occupied units represented the largest component of the total housing decline by Bywater.

The decline of property value from the "upper" to the "upper middle" and increase of units from the "lower middle" to the "upper middle" both help to account for an increase in average value by \$1800. Both the filtration process from "upper" to "upper middle" and renovation of units resulting in a value rise from "lower middle" to "upper middle" probably account for this change.

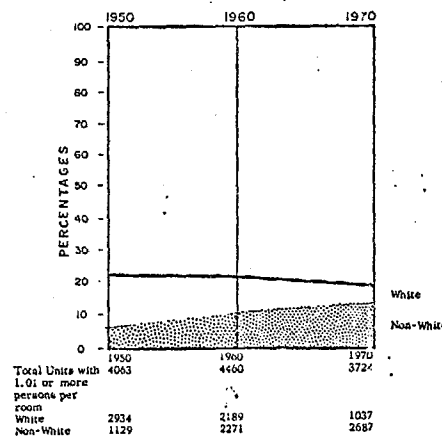
The Bywater Planning Section along with other older planning developments along the river such as Carrollton, University and Lafayette show similarity. There was an increase in population in 0-9 age group in the fifties followed by a decline in the sixties. This could be indicative of the changes in the birth rate for New Orleans. The 1970 rise is probably a produce of the higher birth rate for 1960 in the previous age category

HOUSING

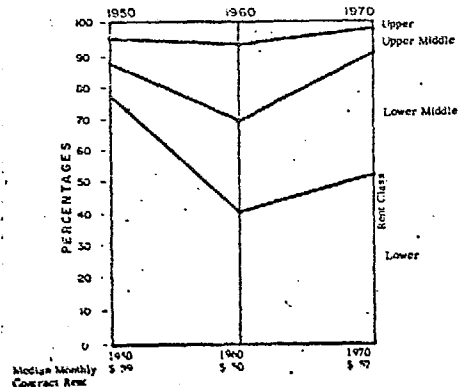
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

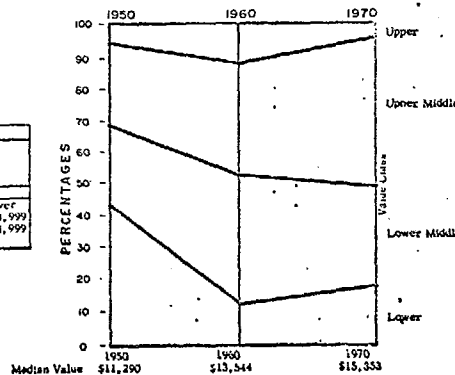


RENT

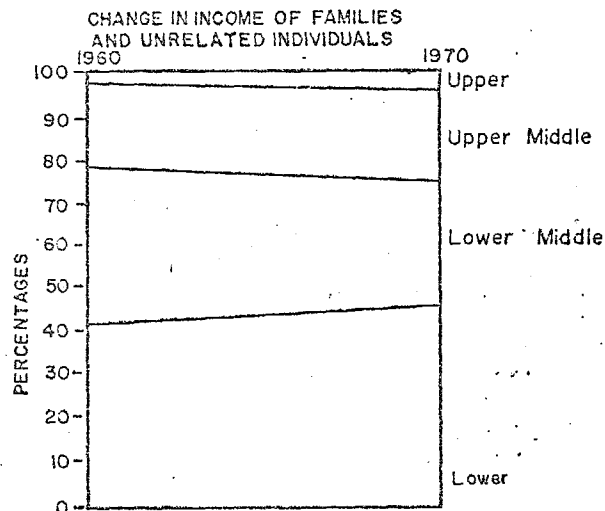
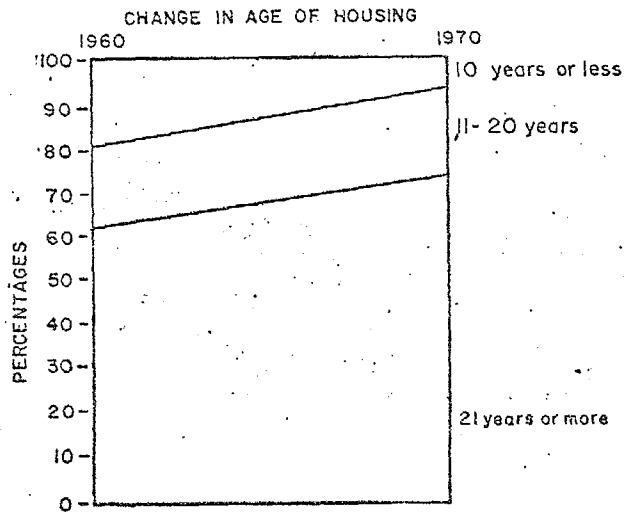


CLASS	RENT
Upper	\$100 or more
Upper Middle	\$80 - \$99
Lower Middle	\$60 - \$79
Lower	Under \$60
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

VALUE OF UNIT

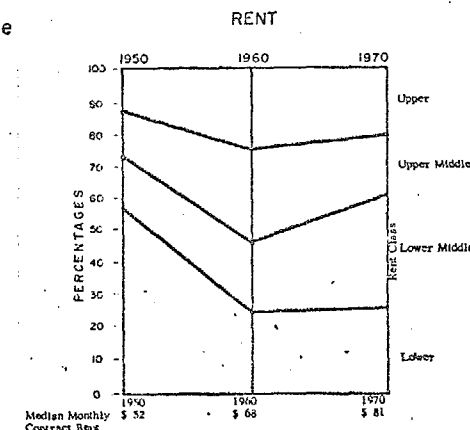
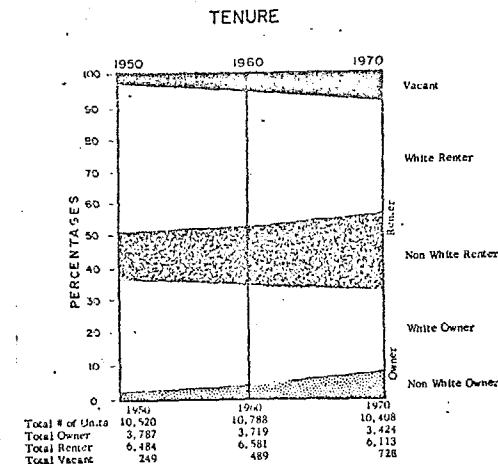
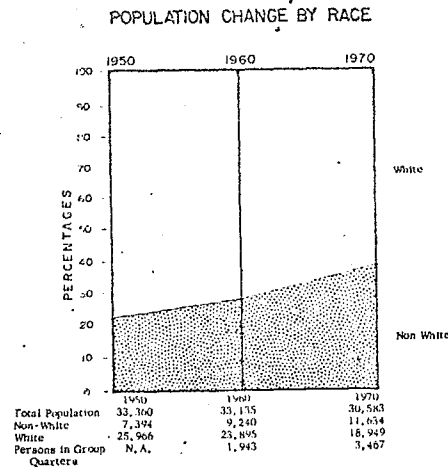


whose members would have in the 1970 ascended into the next age category thus causing an upsurge in population. The 20-29 age category saw a sizable decrease in 1960 followed by a slight increase for 1970. The 30-49 age group, is experiencing a continuous rapid decline in population, a fact common to most areas undergoing a total population decline. In 1960 persons aged 50-64 increased numerically but by 1970 this increase was almost completely eliminated. Aging of the over 50 age group rather than an in-migration would also account for the continual increase in population of the 65 and over group.

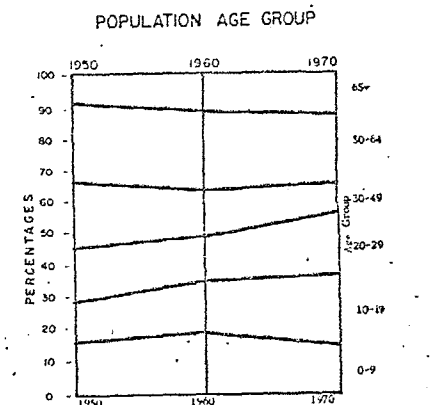


LOWER = Under \$4000
LOWER MIDDLE = \$4000-\$7999
UPPER MIDDLE = \$8000-\$14999
UPPER = \$15000 and over

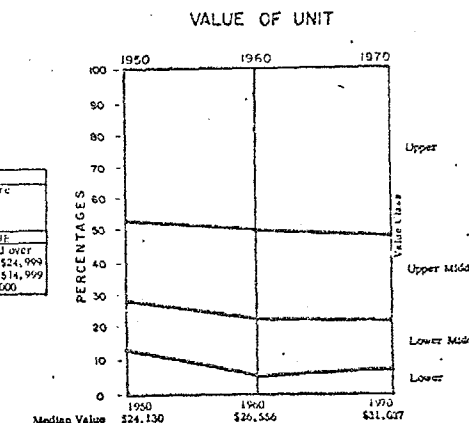
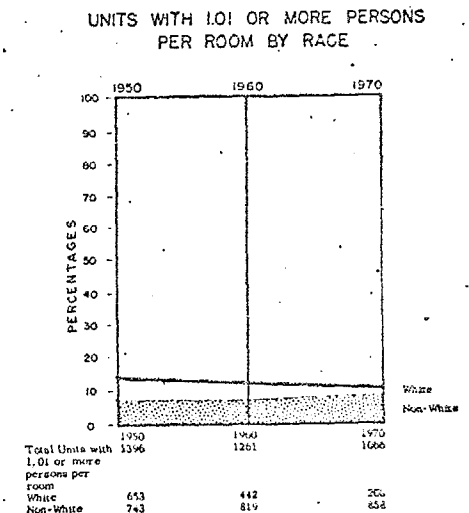
BYWATER HOUSING AGE
AND INCOME CHANGES



POPULATION



HOUSING



CLASS	RENT
Upper	\$100 and more
Upper Middle	\$ 80 - \$99
Lower Middle	\$ 60 - \$79
Lower	Under \$60
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

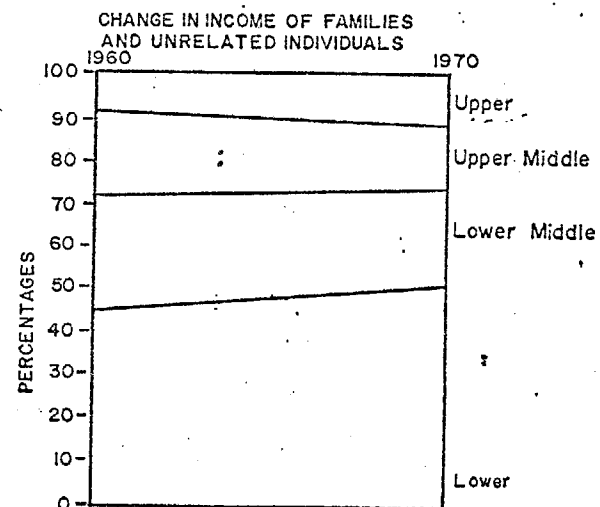
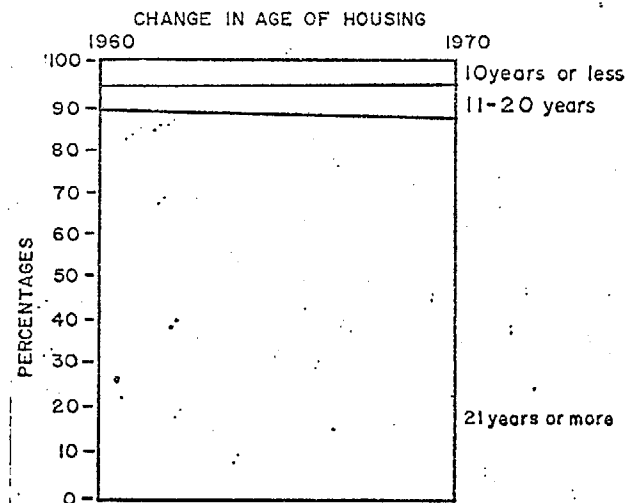
CARROLLTON (Planning Section VI)

The Carrollton area showed mostly minor changes among factors measured during the 1960's with non white population increasing by 25.9%. The decline in the number of units owned and rented by whites was rather small (under 10%) and appears to be contrary to trends about tenure noted in other sections. The total number of owner and renter occupied units declined by about 470 units for renter occupied dwellings and about 300 units for owner occupied units. It is also probable that some of this loss was due to the census definitional changes as the Community Renewal Program noted several areas of poor quality housing especially adjacent to the Mississippi River. However, the increase in vacant units during the 1960's was higher than the increase during the 1950's.

Monthly contract rent declined in all categories except for units renting from \$60-\$79 and under \$60 which rose only slightly while the value of owner occupied units showed either stability or a decline among all value levels except the lowest which rose by only 63 units. However, the decline in units was small indicating a relatively stable situation among owner occupied units in Carrollton. The average value of an owner occupied unit increased nearly \$4500 and monthly contract rent rose by \$13.

The form of population change for the 0-9 age group is illustrative of the birth rate pattern for New Orleans. Also the high birth rate for the sixties expressed itself in 1970 in the 10-19 age group. The 1970 rise in population in the 20-29 age group after a decline in 1960 again is a product of young people moving into the area surrounding the universities. Decline of persons aged 30-49, a fact evident in all older planning sections, results from the mobile population moving elsewhere. In the two later age groups any increases should be attributed to aging in a previous age group rather than movement because these persons are relatively stable.

CARROLLTON HOUSING AND INCOME CHANGES

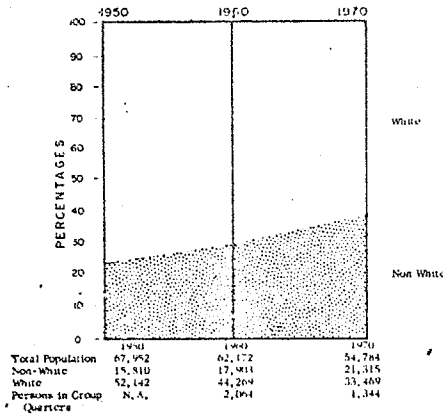


LOWER = Under \$4000
 LOWER MIDDLE = \$4000-\$7999
 UPPER MIDDLE = \$8000-\$14999
 UPPER = \$15000 and over

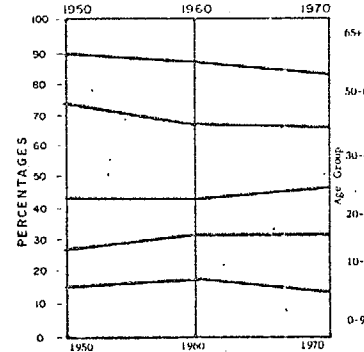
UNIVERSITY PLANNING SECTION 7

POPULATION

POPULATION CHANGE BY RACE

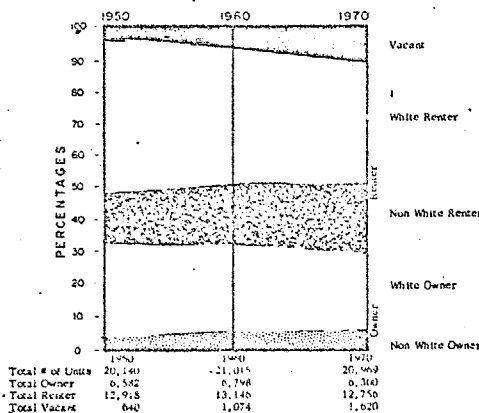


POPULATION AGE GROUP

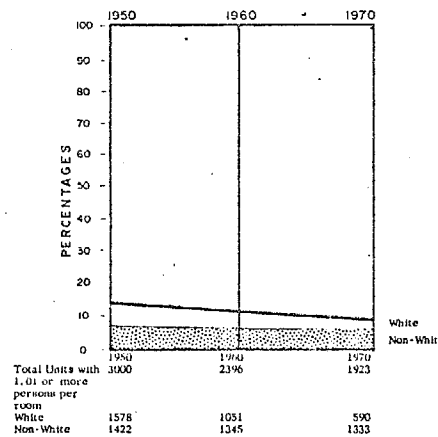


HOUSING

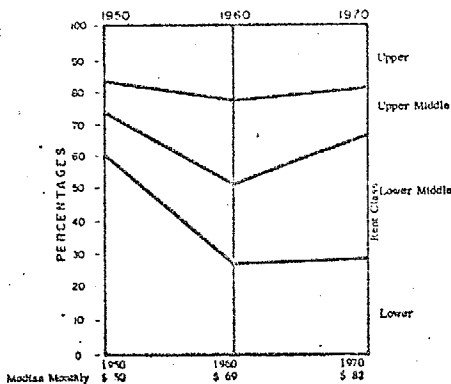
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

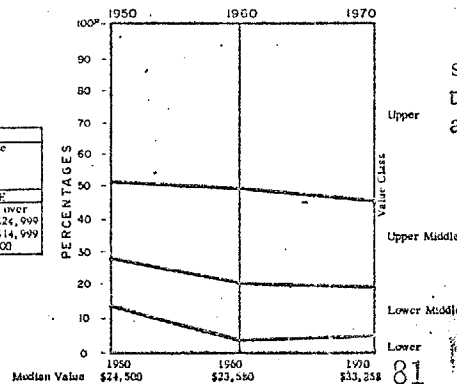


RENT



CLASS	RENT
Upper	\$100 or more
Upper Middle	\$80 - \$99
Lower Middle	\$60 - \$79
Lower	\$40 or less
VALUES	\$25,000
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

VALUE OF UNIT



UNIVERSITY (Planning Section VII)

The University Planning Section exhibits many of the characteristics of the Carrollton Planning Section especially relative to its racial change and tenure. Total population was 54,784. The non-white population increased by 9.2%. Units owned and rented by whites declined in number by 6% and 7.3% respectively. This change was accompanied by a rather small decline among owner and renter occupied units during the sixties. However, the change in vacant units rose from 434 units during the 1950's to 546 units between 1960 and 1970. It is probable that some of the units that were occupied in 1960 are now part of the vacant group in 1970.

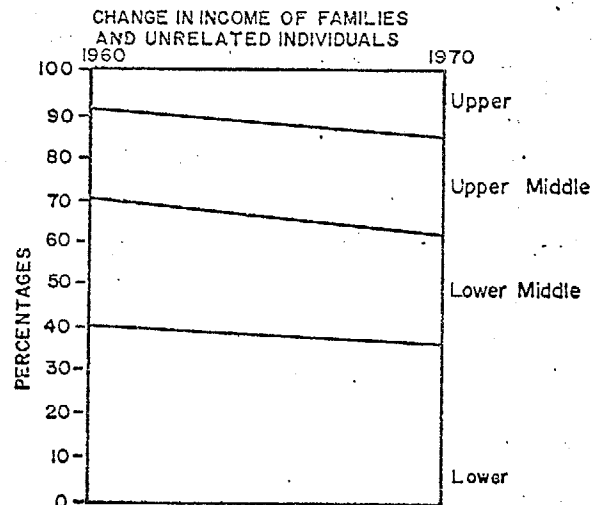
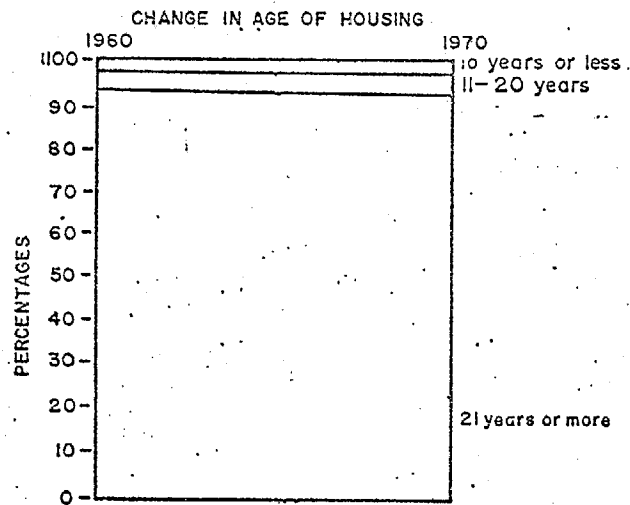
The number of units renting above \$80 declined while housing for under \$80 increased by similar amounts. Greatest losses occurred for units renting from \$80-\$99 while most gains were exhibited for units renting from \$60-\$79.

Values of owner occupied units exhibited some rather unusual changes but could generally be described as "stable". Only units with a value between \$10,000 and \$24,999 in 1960 showed declines. "Lower middle" and "upper middle" units declined slightly. Rather unusual changes occurred in both the "lower" and "upper" categories. Units with values below \$10,000 showed virtually no change while units valued at \$25,000 and more showed a small increase. In most older areas of the city, "lower" valued units would have increased while "upper" classified units would have declined.

Both average rent and value exhibited increases. Rent rose by \$13 during the 1960's. Values increased by nearly \$10,000 illustrating the effect of the stability of housing above \$25,000. This information reveals the desirability of several of the areas in the University Planning Section to retain its present resident while other areas within the Section experienced population movement. Planning unit analysis will reveal further information about areas within the Section.

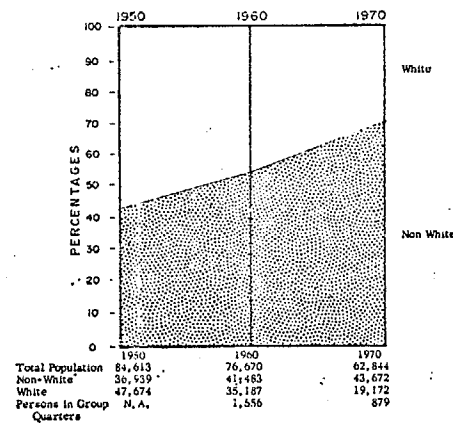
The pattern of population change by age group reveals similar patterns to changes occurring in the older sections of the city. Namely, the increase in persons aged 20-29 and 65 and over tend to predominate.

UNIVERSITY HOUSING AND INCOME CHANGES



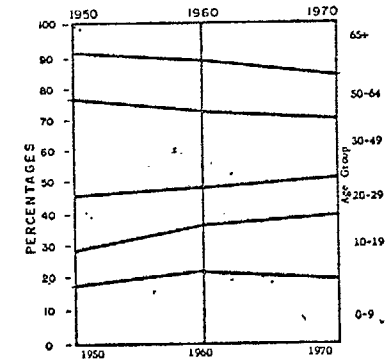
LOWER = Under \$4000
LOWER MIDDLE = \$4000-\$7999
UPPER MIDDLE = \$8000-\$14999
UPPER = \$15000 and over

POPULATION CHANGE BY RACE



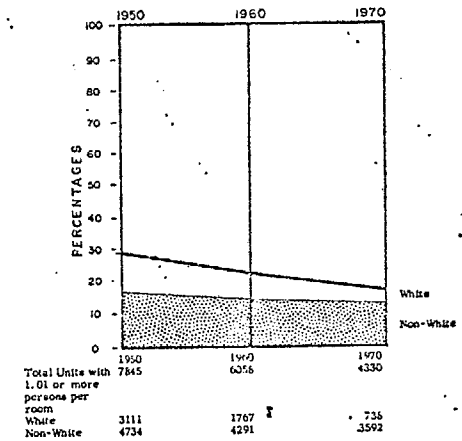
POPULATION

POPULATION AGE GROUP

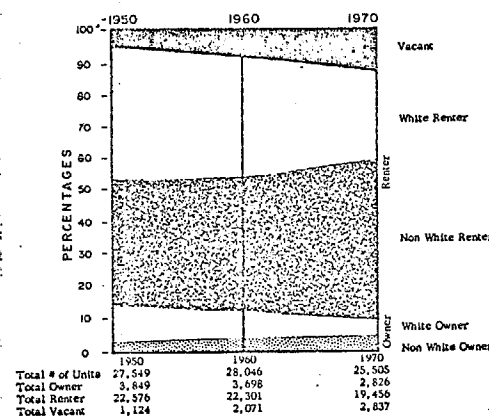


HOUSING

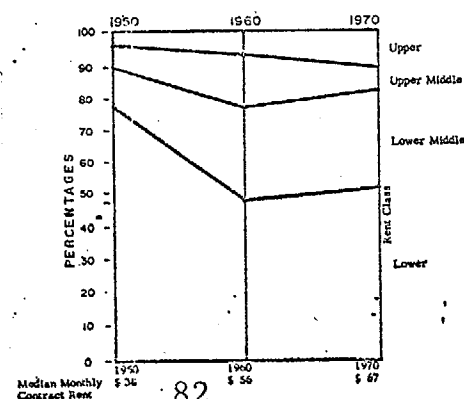
UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE



TENURE

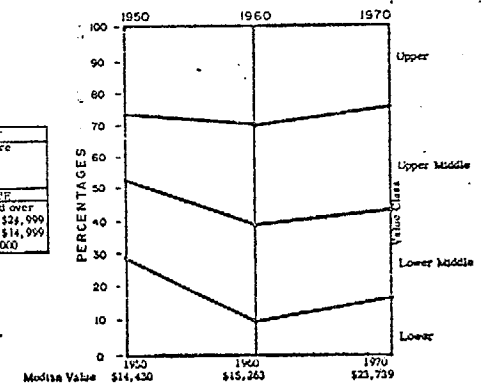


RENT



CLASS	RENT
Upper	\$10 or more
Upper Middle	\$8 - \$99
Lower Middle	\$6 - \$79
Lower	Under \$6
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

VALUE OF UNIT



LAFAYETTE (Planning Section VIII)

The Lafayette Planning Section contains some of the poorest housing and most densely populated areas in the city. The overall population was 62,844. The non-white population continued to increase during the 1960's (+ 15.2%) and approached 65% of the section's total population in 1970. Units owned and rented by white occupants declined 8.4% for owner occupied and 11.6% for renter occupied units.

In 1950 the total number of units rented in Lafayette exceeded 22,500 units compared to 3800 owner occupied units and 1,124 vacancies. These rented units represent the largest number of such units in any Planning Section. During the 1950's the number of owner and renter units began to decline as the number of vacancies showed an increase.

Between 1960 and 1970, the trends described during the previous decade continued and increased substantially. Renter occupied units dropped by 2845 units, compared to a loss of 275 units between 1950 and 1960. Owner occupied units declined by 872 units compared to 131 units during the 1950's and the number of vacant units increased. In 1960 vacancies increased by 947 units and by 1970 the vacant number climbed an additional 897 units. There appears to be a strong indication that the combination of a high loss of units (-2641) and an increase of only 897 vacancies means that many units in 1960 were not included in 1970 because of the census definitional change. In addition, another possible reason for the change was the construction of Guste Homes upon a site which had very high densities prior to construction of the housing project.

Change within the rent categories in Lafayette reveal the unique contrasts in rental housing. The number of units renting for \$100 and more increased.

Units renting from \$80-\$99 declined noticeably. Note that the decline in "upper middle" units is reflected in gains among units renting for under \$80 and possibly in renovation resulting in an increase of "upper" classified units. However, the "loss" of units by a change in census definition is not revealed in the "rent" graph but probably occurred in the "lower" and "lower middle" categories.

This combination of an increase in units renting for \$100 or more, a large decline in units renting for \$80-\$99 and small changes in units renting for under \$80 clearly illustrate the wide diversity of rental housing available in Lafayette and the

rather unique varieties of housing in close proximity which is characteristic of much of New Orleans housing market. However, it should be made clear that there are patterns of housing homogeneity that predominate.

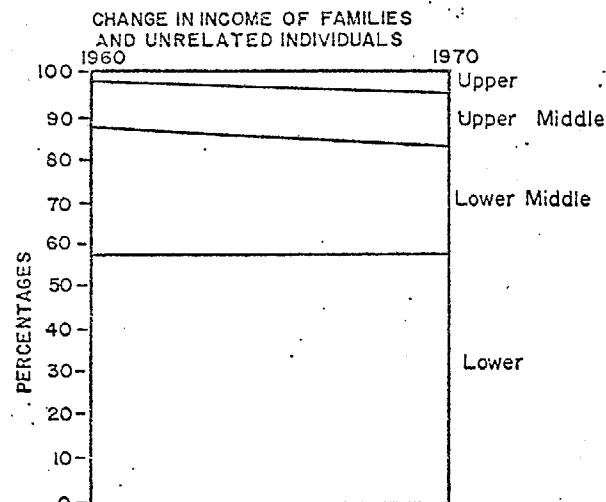
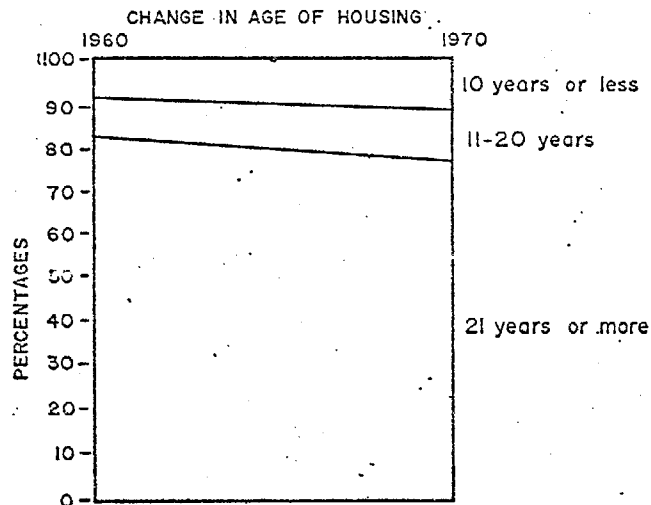
The trends indicated for owner occupied housing in Lafayette do not appear to reveal the unusual changes seen in rental housing. Units in the "upper" class declined while the "lower" class increased. However, the increase among units with value under \$10,000 was quite small in comparison to the total loss (\$10,000 and over) of units. This information leads to speculation that some of the units in 1960 were lost in 1970 due to the definitional change as well as possible demolitions.

In line with unusual trends in Lafayette, the average value of an owner occupied unit increased by \$8,500. This gain is probably the result of increasing value of homes in the Garden District and Lower Garden District many of whose homes are high enough in value to offset the net loss in owner occupied units. The average rental value increased by only \$11 probably reflecting the high loss in renter occupied units even though the "upper" level showed gains.

Among the age groups between 1960 and 1970, the groups aged 10-19 and 65 and over increased which is a trend consistent with older planning sections. The remaining age categories declined slightly or remained generally stable. These changes represent a composite of a variety of different trends of population movement in a planning section with an unusual combination of neighborhoods.

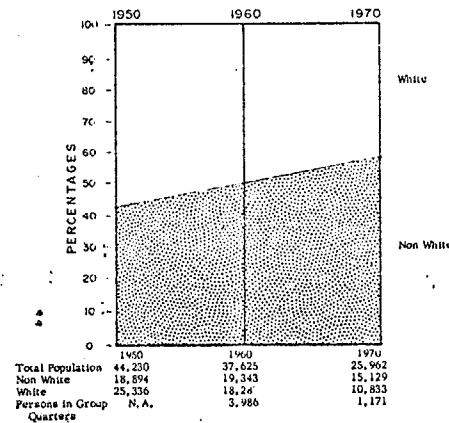
CENTRAL BUSINESS DISTRICT PLANNING SECTION - 9

LAFAYETTE HOUSING AND INCOME CHANGES



LOWER = Under \$4000
 LOWER MIDDLE = \$4000-\$7999
 UPPER MIDDLE = \$8000-\$14999
 UPPER = \$15000 and over

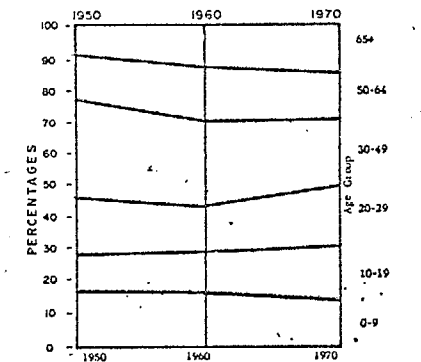
POPULATION CHANGE BY RACE



Total Population	44,230	37,625	25,962
Non White	18,894	19,343	15,129
White	25,336	18,282	10,833
Persons in Group Quarters	N.A.	3,986	1,171

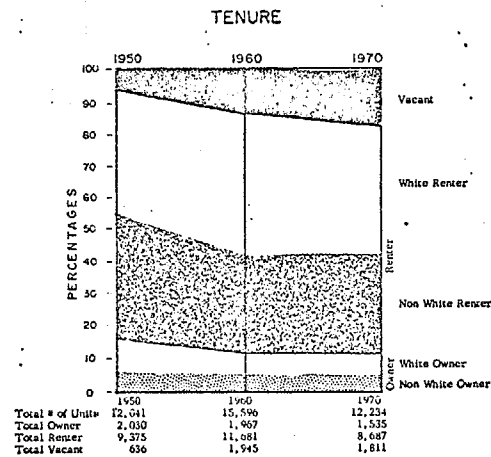
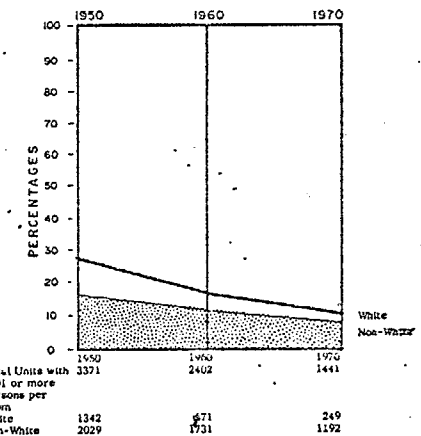
POPULATION

POPULATION AGE GROUP



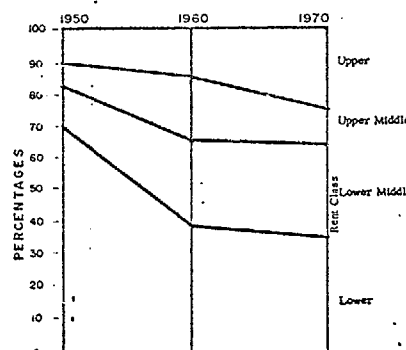
HOUSING

UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE



Total # of Units	12,041	15,596	12,234
Total Owner	2,030	1,967	1,535
Total Renter	9,315	11,629	10,699
Total Vacant	636	1,945	1,811

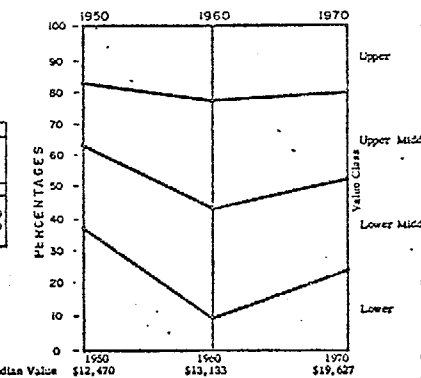
RENT



Median Monthly Contract Rent	\$43	\$61	\$81
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CLASS	RENT
Upper	\$120 or more
Upper Middle	\$80 - \$99
Lower Middle	\$60 - \$79
Lower	Under \$60
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

VALUE OF UNIT



Median Value	\$12,470	\$13,133	\$19,627
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CENTRAL BUSINESS DISTRICT HOUSING AND INCOME CHANGES

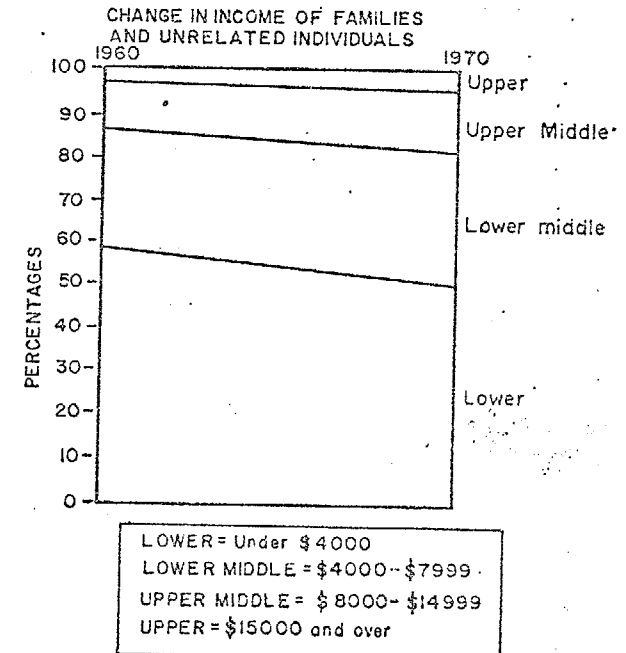
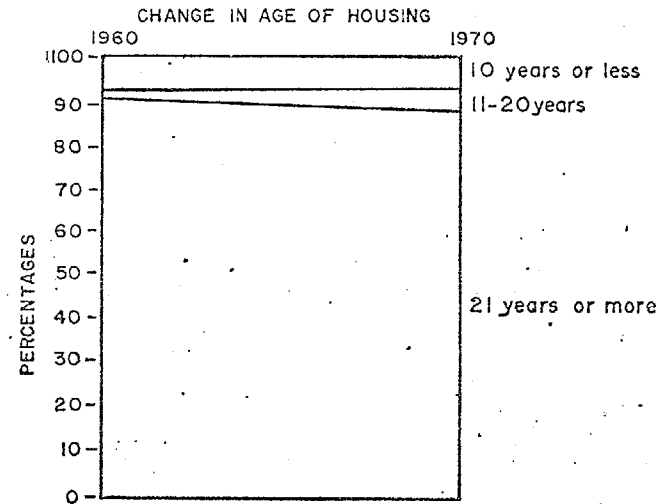
CENTRAL BUSINESS DISTRICT (Planning Section IX)

Because of federal projects the CBD has and is undergoing more physical changes than any other planning section in the city. This area contains the greatest variety and intensity of land uses in the city including the historic Vieux Carre'. Largely as a result of substantial physical projects along with deterioration and removal of housing around the CBD core area, the total population has declined. Note that the net non-white population increased during the 1950's but declined in the sixties. However, the percentage of non-white residents continued to increase in the sixties extending the pattern seen during the fifties.

The most notable change in tenure occurred in the increased percentage of vacant units and the leveling off of other tenure categories. The decline in the number of units in the CBD among all categories is largely the result of removal and, in some cases, elimination due to census definitional change of a housing unit.

Rent and value classifications give some indication of the nature of the housing stock in the section. Most notable is the increase among rented units classified as "upper". This change is probably the result of renovated apartments in the Vieux Carre'. The increased number of vacant units noted in the preceding paragraph no doubt contain many of these units which were awaiting occupants on census enumeration day. Among value categories, little change occurred in any category except the rise in "lower" classed units which appears to indicate that there was more of a renewed interest in rental property than in owner occupied units. However, the average value of owner occupied units did rise by almost \$6500. This increase may be due in part to demolition of lower valued units.

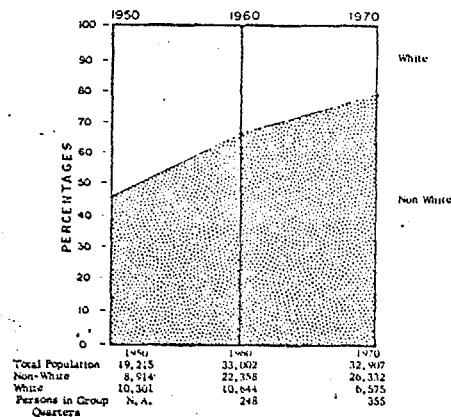
Concerning age categories of the population, the 10-19 and 20-29 groups showed the increases during the sixties and indicates that more young people are moving into the area, especially in the Vieux Carre'. The increase in persons aged 65 and over was consistent with overall citywide trends.



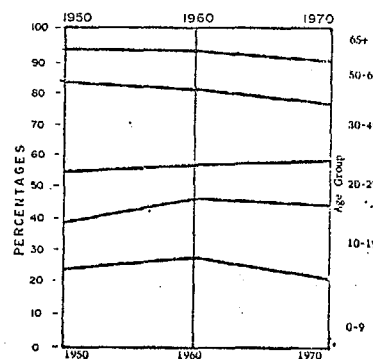
DOWNTOWN PLANNING SECTION 10

POPULATION

POPULATION CHANGE BY RACE

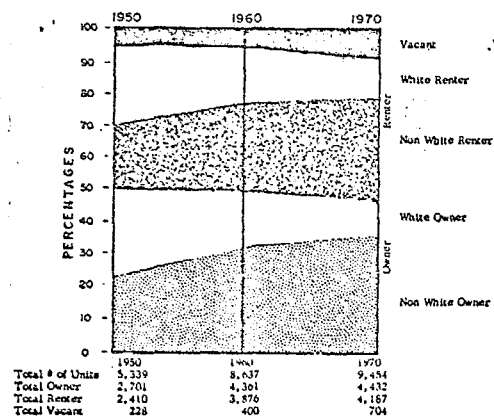


POPULATION AGE GROUP

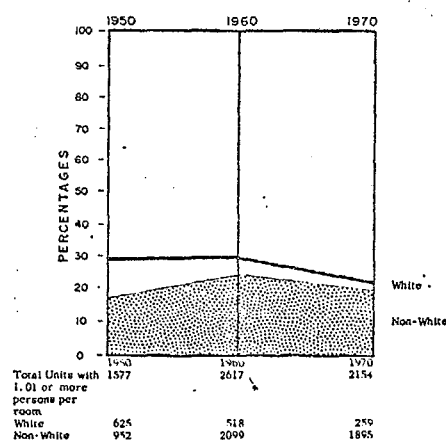


HOUSING

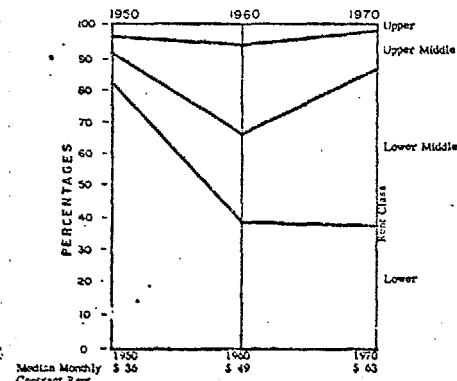
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

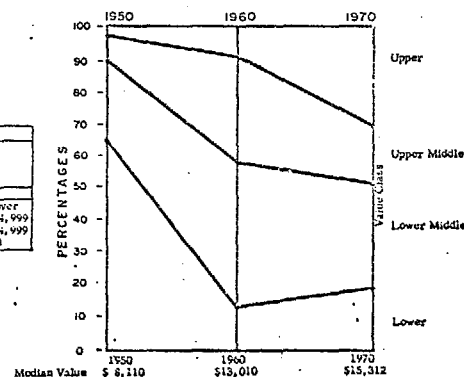


RENT



CLASS	RENT
Upper	\$141 or more
Upper Middle	\$80 - \$99
Lower Middle	\$60 - \$79
Lower	Under \$59
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$5,000 to \$14,999
Lower	Under \$5,000

VALUE OF UNIT



DOWNTOWN (Planning Section X)

The nonwhite population in the Downtown Planning Section continued to rise during the 1960's and reached nearly 80% - one of the city highest. Non-white ownership and rentership also continued to climb. It is important to note that nonwhite ownership exceeds nonwhite rentership by 4.6% which together represent about 60% of the total housing stock.

It appears that this high degree of owner occupancy among nonwhites and whites (although whites represent 20.1% of the population in Downtown) has a direct effect upon change in dwelling units. Both the number of owner and renter occupied units increased during the 1960's as well as the number of vacant units. Again, the trends consistent with older parts of the city that indicate high declines in owner and/or rented units with a high increase in vacancies and/or a loss of units due to census definitional change did not occur.

Although some owner and renter occupied units did become vacant, the number of units increased in both tenure categories. Probably, most of this building activity occurred south of Claiborne Avenue which is outside of the Lower Ninth Ward Urban Renewal Area.

Changes among units according to monthly contract rent reflect this increase in construction. Units renting for over \$80 declined. However, the number of units renting from \$60 to \$79 rose. Therefore, one can assume that most of the new rental units constructed rented for \$60-\$79.

The value of owner occupied units presents a somewhat more complicated picture. There was an increase in approximately 71 units which possibly was one factor to affect the "upper" and "lower" categories. It is difficult to isolate this increase because of the shifts in values that have occurred among existing units. Thus, the rise in units (some of which may have risen to over \$25,000) has helped to shift the overall value.

Average value of owner occupied units increased by \$2300 probably reflecting the new construction and an increase in value. Average monthly contract rent increased by \$14 in spite of the increase in units renting from \$60 to \$79.

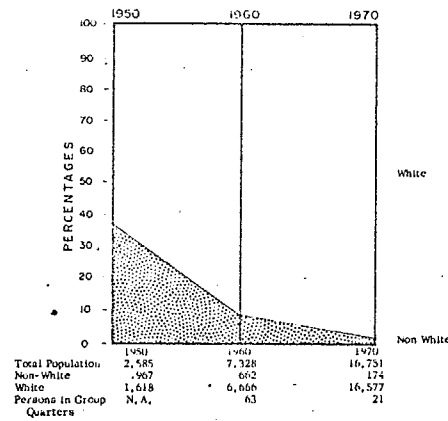
The Downtown Planning Section has experienced steady population increases in all age categories except 0-9 and 30-49. This would indicate that some families have probably left this planning section and that the lower birth rate in 1970 for New Orleans would be reflected in a population decrease in 1970 for the 0-9 age category.

DOWNTOWN HOUSING AND INCOME CHANGES

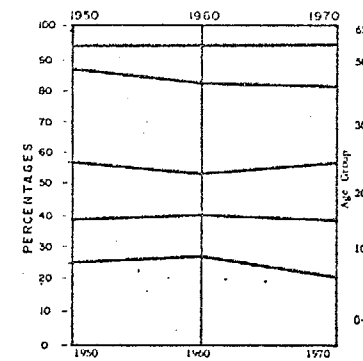
EDGE LAKE PLANNING SECTION II

POPULATION

POPULATION CHANGE BY RACE

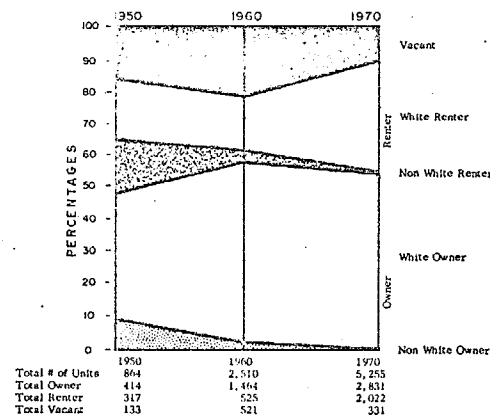


POPULATION AGE GROUP

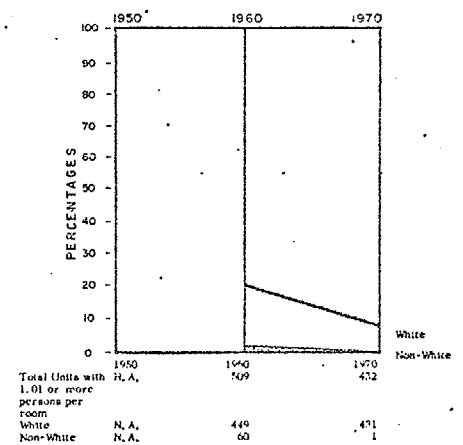


HOUSING

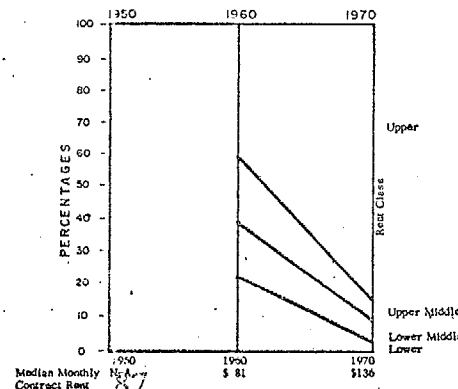
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

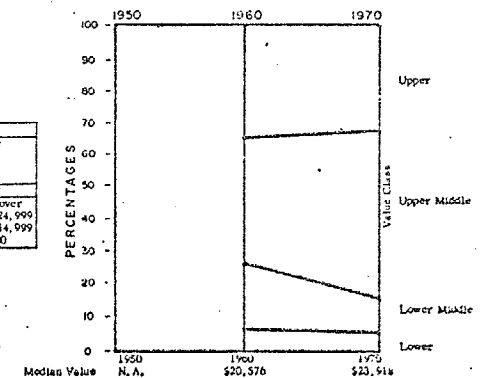


RENT

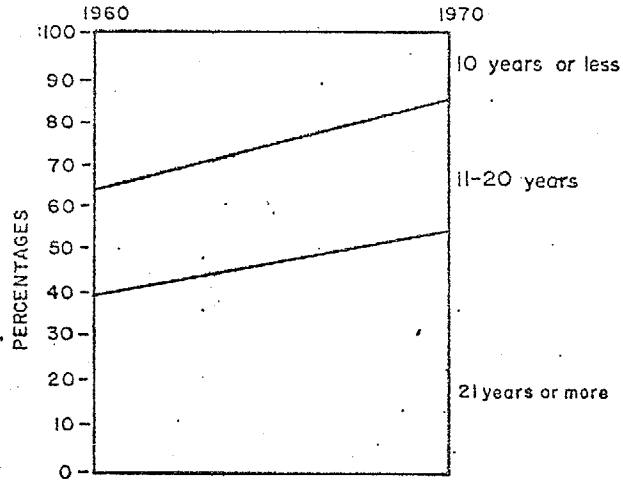


CLASS	RENT
Upper	\$100 and over
Upper Middle	\$ 80 - \$99
Lower Middle	\$ 60 - \$79
Lower	Under \$ 60
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

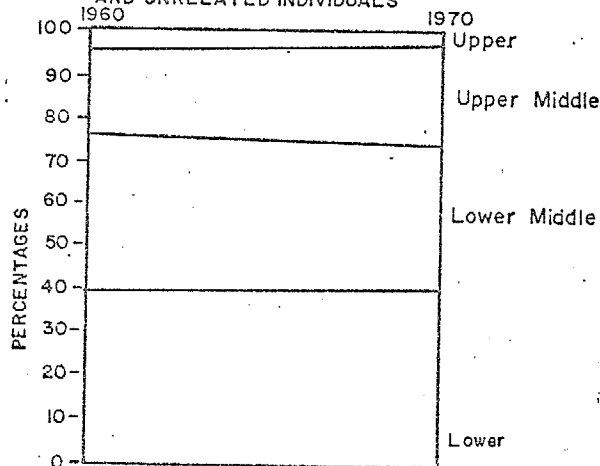
VALUE OF UNIT



CHANGE IN AGE OF HOUSING



CHANGE IN INCOME OF FAMILIES AND UNRELATED INDIVIDUALS



LOWER = Under \$4000
 LOWER MIDDLE = \$4000-\$7999
 UPPER MIDDLE = \$8000-\$14999
 UPPER = \$15000 and over

EDGE LAKE (Planning Section XI)

The Edgelake Planning Section is the first in a series of new and developing sections to be discussed in this report. The statistics from the 1960's indicate that many new developments are under construction and/or have been completed and the population is increasing.

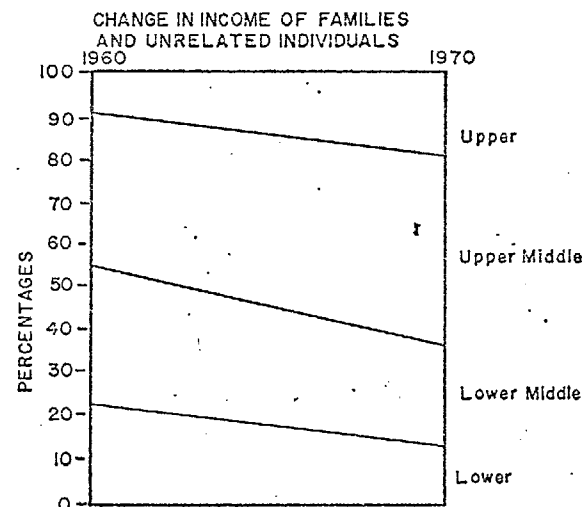
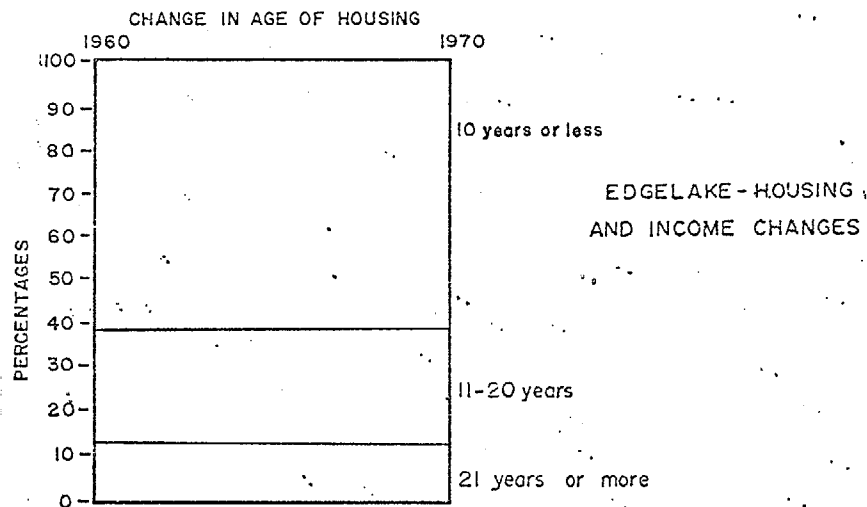
The nonwhite population declined by 8.1% during the 1960's and reached a low of 0.9%. This figure is a reflection of the large influx of new residents who are largely white. Units owned and rented by whites also increased reaching high levels. The number of new units increased quite significantly during the 1960's - 1367 new owner occupied and 1497 new rental units. As a result, the percentage of renter occupied units increased 18.1%. Since the owner occupied percentage declined only slightly, the remainder of the increase in rental units is reflected by a sharp drop in vacancies. In developing areas vacancy rates are usually the result of units that were awaiting occupancy and had not yet been occupied on the day that the census was taken. This situation contrasts to older areas where vacancy rates are frequently the result of a decline in the number of units and an indication that transitions are occurring in various areas within the section. In Edgelake and other newer sections vacancies result more from an area undergoing urbanization. However, both kinds of vacancies can and often do occur in the same area.

Changes in monthly contract rent also reflect the increase in population. Large gains in units renting for over \$100 are revealed by the Census. In 1970 the number of "upper" classified units was 6.8 times more than the combined total of the other categories.

The number of units valued from \$15,000 - \$24,999 and over also rose considerably. Units of \$25,000 and over remained about the same while homes between \$10,000 and \$14,999 declined. These changes are reflections of the value of new homes that were constructed during the 1960's.

Average home value rose nearly \$3400 while average monthly contract rent soared to \$136. This increase of \$55 clearly reveals the effect of the higher priced rental units that were constructed in the area.

Concerning age groups, Edgelake, relatively new planning section is experiencing rapid total population growth. Analysis of age groups indicates percentage increases during the sixties in the 10-19 and 20-29 age group categories. Slight declines occurred in other groups except in the 50-64 and 65 and over categories which remained stable.

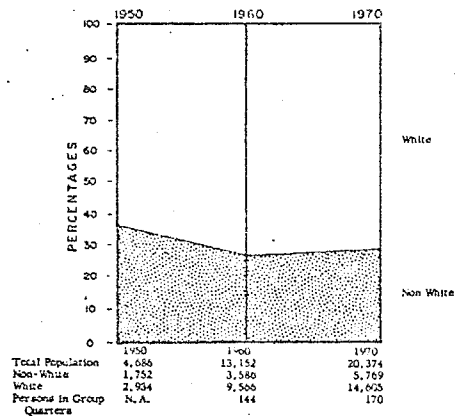


LOWER = Under \$4000
 LOWER MIDDLE = \$4000-\$7999
 UPPER MIDDLE = \$8000-\$14999
 UPPER = \$15000 and over

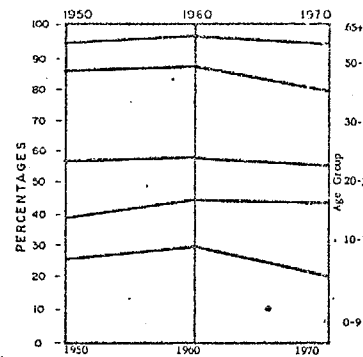
EAST GENTILLY PLANNING SECTION 12

POPULATION

POPULATION CHANGE BY RACE

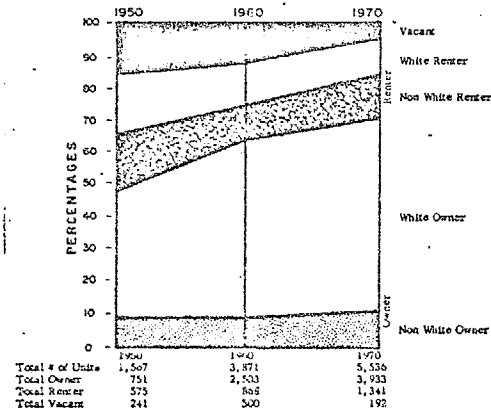


POPULATION AGE GROUP

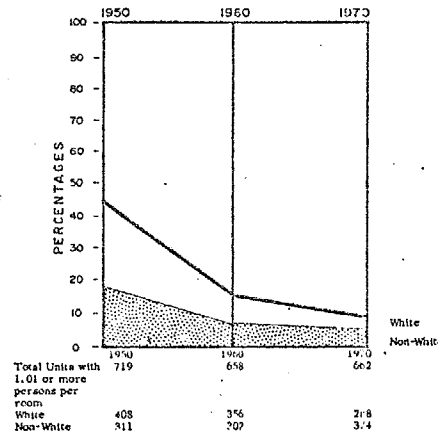


HOUSING

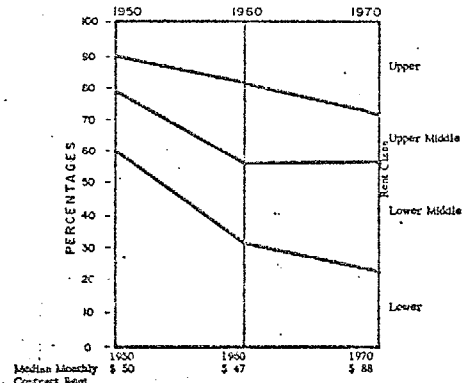
TENURE



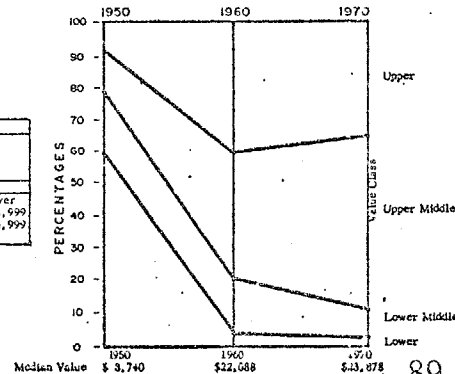
UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE



RENT



VALUE OF UNIT



EAST GENTILLY (Planning Section XII)

The East Gentilly Planning Section is experiencing growth similar to that of Edgelake but it includes several older areas and had a larger nonwhite population in 1960.

As the Section population is increasing largely from an immigration of new persons, the racial population has remained the same whereas in Edgelake, the percentage of nonwhites declined considerably. This indicates that both non-whites and whites are moving into the section. Further analysis of Planning Units in East Gentilly will reveal whether residential patterns are largely integrated or segregated.

Racial change by tenure also reveals a relatively stable pattern. Whites show a predominance of owner occupied units, while nonwhites generally tend to occupy rented units.

The Section's rapid growth is closely reflected in the number of new units constructed. Owner occupied units increased by 1430 units and renter occupied units increased by 473 units during the 1960's. The proportion of owner occupied units increased 7.3% still indicating the predominance of the owner occupied unit in the section. However, the percentage of vacancies declined considerably compared to the rising number of occupied units. As in Edgelake, most of the vacancies were probably units awaiting occupancy and were vacant when the Census was taken.

Changes in monthly contract rent showed some distinct patterns. The number of "lower middle" and "upper" classified units each more than doubled during the 1960's. Units classed as "upper middle" declined slightly while "lower" classified units decreased by about 5%. The rise in units of \$100 or more appears to be the result of new construction, and the increase in units between \$60 and \$79 may have occurred from a rise in rental values under \$60 and the subsequent decline in that category.

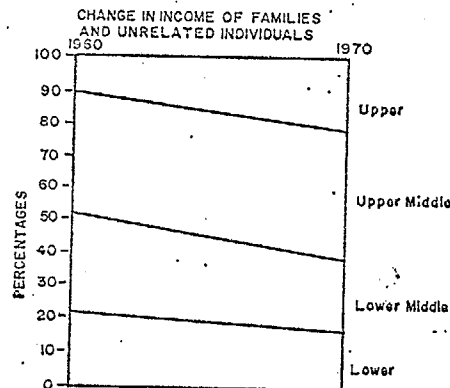
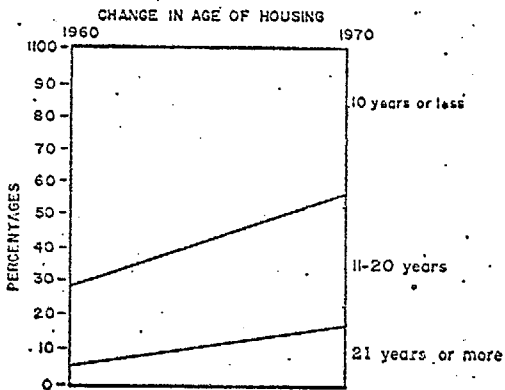
Home ownership in East Gentilly increased and the census statistics are reflective of the changes. "Upper middle" classed units increased appreciably with housing valued as "upper" indicating a very small decline. Units valued under \$15,000 showed little change with the possibility that the decline in "lower middle" units may also be apart of the large increase in "upper middle". However, most of the increase in "upper middle" appears to have been the result of new construction.

ALGIERS PLANNING SECTION 13

Average owner occupied value increased by almost \$1800 and monthly contract rent increased by \$41. Both are reflective of the increased building activity in East Gentilly.

The rapid urbanizing East Gentilly section experienced tremendous population gains during the last two decades. Indicative of a growing area, all age categories experienced increases for the years shown. Based upon percentage relationships of age categories to total section population, increases occurred among 10-19, 50-64, and 65 and over categories. Percentage declines occurred in 0-9 and 30-49 age groups. However, there was a numerical increase in these groups which is characteristic of developing areas. The large increase in the numbers of persons 0-9 is evidence that there is a large influx of families into the area. The numerical increases of the 50-64 and 65 and over categories, result more from aging in the younger age groups than from any other factors.

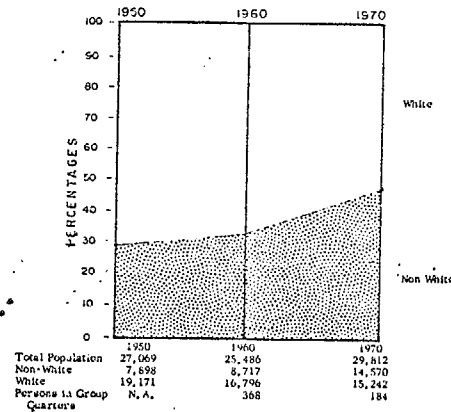
EAST GENTILLY HOUSING AND INCOME CHANGES



LOWER = Under \$4000
LOWER MIDDLE = \$4000-\$7999
UPPER MIDDLE = \$8000-\$14999
UPPER = \$15000 and over

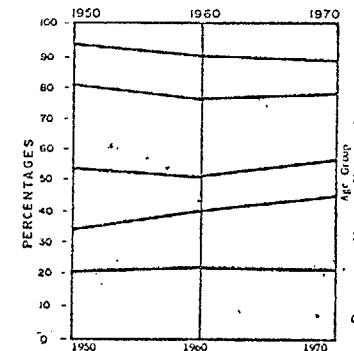
Median Monthly Contract Rent

POPULATION CHANGE BY RACE



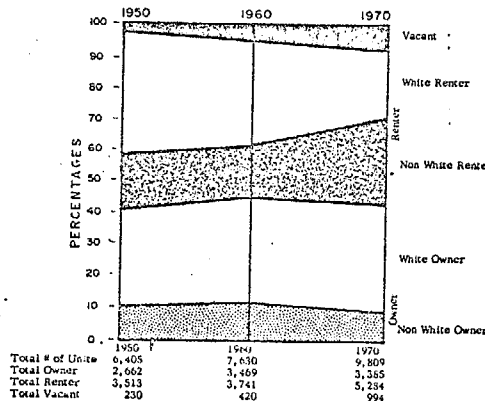
POPULATION

POPULATION AGE GROUP

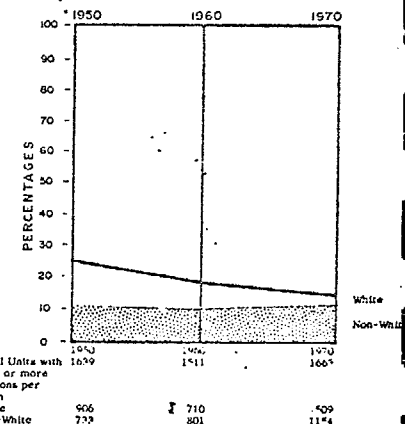


HOUSING

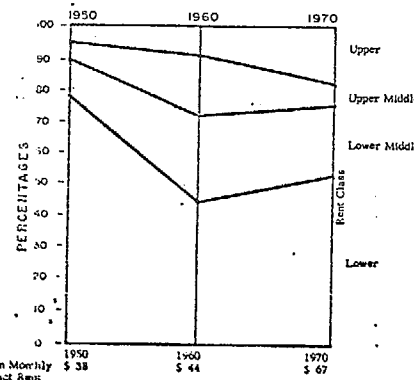
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

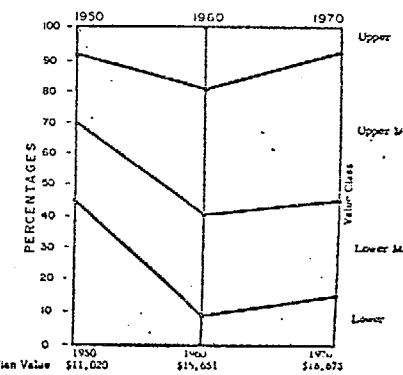


RENT



CLASS	RENT
Upper	\$100 or more
Upper Middle	\$80 - \$99
Lower Middle	\$60 - \$79
Lower	Under \$60
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$10,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

VALUE OF UNIT



Median Value

ALGIERS (Planning Section XIII)

The Algiers Planning Section is a contrasting variety of old and new housing and the census statistics indicated changes occurring in the Section. The nonwhite population increased 5.1%. Contrary to other Planning Sections, the variable of rental units showed the greatest decline among whites and increase among nonwhites.

Study of this area by its tenure indicates the predominate increase of rental units since 1960. There was an increase of 1543 rental units during the 1960's while the number of owner occupied units decreased by 84 units. The vacancy rate climbed by 574 units which was three times higher than the rate of change during the 1950's. The increase in rental units was a combination of the construction of the Algiers-Fischer Homes and new apartments mostly in the downriver parts of the section.

Analysis of the contract rent reveals these changes in rental housing. The number of units renting for \$100 or more during the 60's increased substantially. This represents much of the new apartment complex construction in the downriver areas. The decline in "upper middle" classified units is reflective of a possible loss in value which was picked up in the increases of "lower middle" and "lower" classed units. However, percentage relationships of rent level to total units indicate a smaller increase in "lower" classified units than in a decline of "upper middle" units. However, the overall percentage of "lower" units is now 50% of the total housing stock in the Section and the numerical increase in units renting for under \$60 exceeded the decline in units renting from \$80-\$99. Most of the remainder of units under \$60 are those of the Algiers-Fischer housing project.

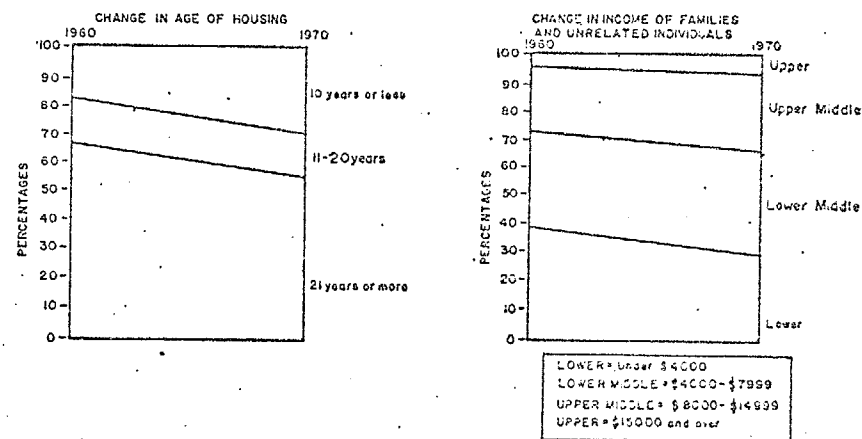
The value of owner occupied housing clearly reveals that new construction in Algiers was virtually all rental units. Units of over \$25,000 declined. Much of this decline may be reflected in the increase in units valued at \$15,000 to \$24,999. The remainder of this decline in "upper" classified units probably was picked up (along with any loss in "lower middle" units) in the "lower" classified increase. If these changes are valid, then it appears that some of the units valued over \$25,000 incurred some losses in value.

The average value of owner occupied units rose by \$1,000 and reflects the gain in units from \$15,000 to \$24,999. Monthly contract rent rose by \$23 and indicates an increase in the cost of rental housing.

Comments should be made about the increase in units with 1.01 or more persons per room. Generally, the density of housing units declined as a result of the overall loss in population in the city. However, the increase in Algiers probably was the result of the housing project constructed during this time.

The pattern of population change for the Algiers area shows some interesting features unlike those of other areas with total population increases. Most notable is the fact that for the 30-49 age group the 1970 figures show a small population decrease. There is usually a continual large population increase in this age category. It would seem that there was not a great influx of people in the middle age categories, but rather an increase in family size shown by the growth of the groups 0-19. There was a sizable decrease in 1960 in the 20-29 age group which appeared to remain stable during the sixties. The small loss in the 50-64 age group is probably not significant and is more likely the result of the aging process as revealed by increases in population 65 and over.

The 65 and over population changes concur with what is happening on a city wide basis: an increase in total population for persons 65 and over.

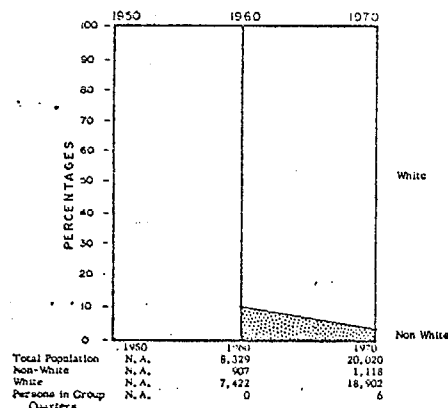


ALGIERS HOUSING AND INCOME CHANGES

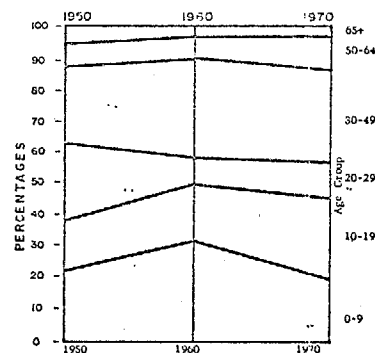
AURORA PLANNING SECTION 14

POPULATION

POPULATION CHANGE BY RACE

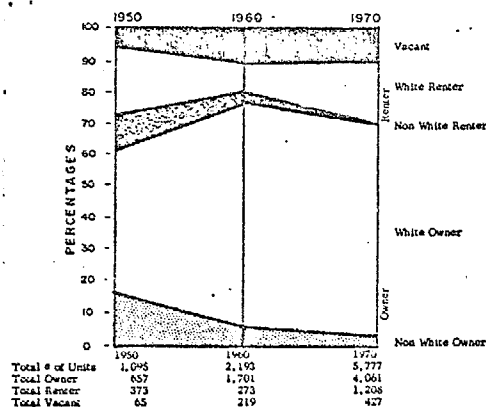


POPULATION AGE GROUP

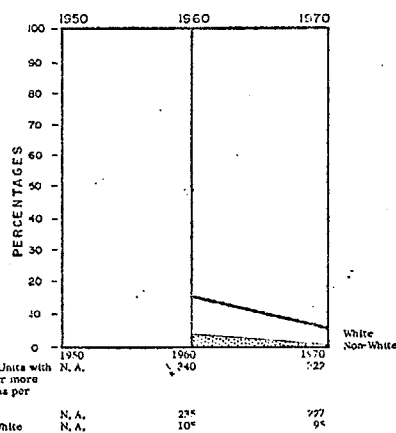


HOUSING

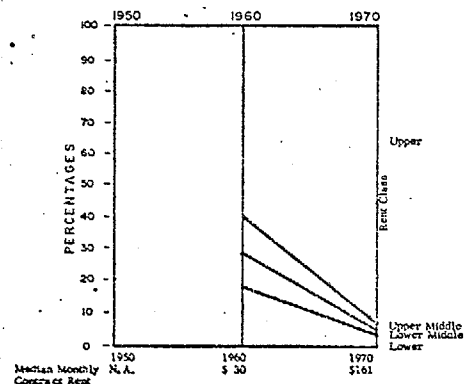
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

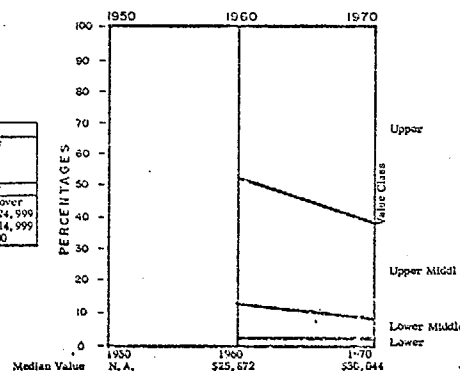


RENT



CLASS	RENT
Upper	\$100 or more
Upper Middle	\$80 - \$99
Lower Middle	\$60 - \$79
Lower	Under \$60
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

VALUE OF UNIT



AURORA (Planning Section XIV)

Aurora is another planning section which has experienced rapid growth during the 1960's. The nonwhite population declined 5.3% to a low of 5.6% of the total population in the Section. During the 1960's the proportion of units rented by whites rose rather substantially but the percentage of owner occupied units showed little change among white residents. However, together both account for almost 85% of the total housing stock in Aurora. Although there was an increase in the proportion of rented units by whites the housing stock was over-whelmingly owner occupied.

During the 1960's there was an increase of 2360 owner occupied units compared to 1044 units during the 1950's while 1960 and 1970 vacant units grew by 208 units. The proportion of renter units grew slightly more than one-fifth of the total number of units in 1970.

The contract rent patterns were quite evident. The number of units renting for over \$100 rose considerably and totally predominate over all other categories. The numbers reported for the other rental categories are essentially too small to gain any significance.

Value for owner occupied housing indicates a somewhat more complicated pattern but still indicates a predominate gain of units valued over \$25,000. In 1970 the number of "upper" classified units were greater than the total of all the other categories combined. "Upper middle" classed units had grown by 567 units while units under \$15,000 had grown slightly but their percentage as a total of all units had declined in both categories owing to the increase in "upper" classed units.

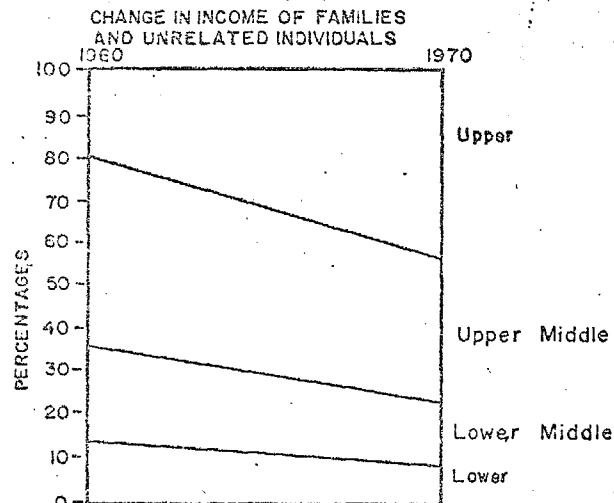
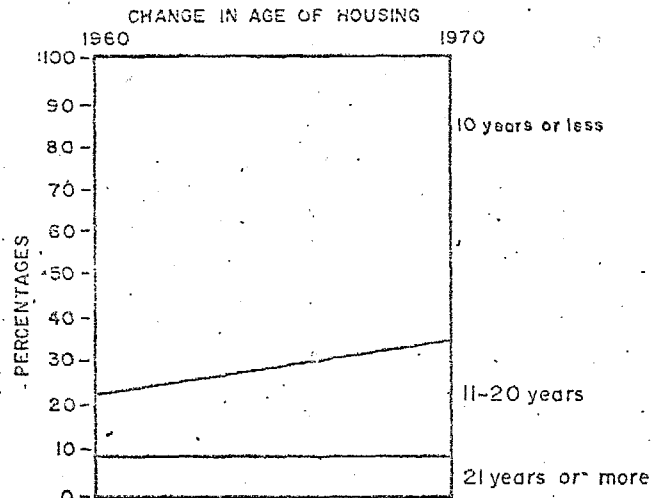
Average owner occupied unit value rose by \$4172 while average monthly contract rent soared to \$161. Both these figures reflect the increased building activity and the rise in rent is especially indicative of the newly constructed apartment complexes.

Total population increased dramatically during the 1960's growing at a rate that was almost 1½ times the actual population of the Section in 1960.

In Aurora, the pattern of population change has been one of constant increase. Percentage increases to the total population occurred in the 10-19, 20-29 and 50-64 age groups. From this information one could conclude that there has been an influx of both young and middle age families into the area. It is rather uncharacteristic of a developing area that there would be a rise in the 50-64 age category. This portion of the population is usually relatively stable and does not generally exhibit a sizable proportional increase. It would seem that this category exhibits

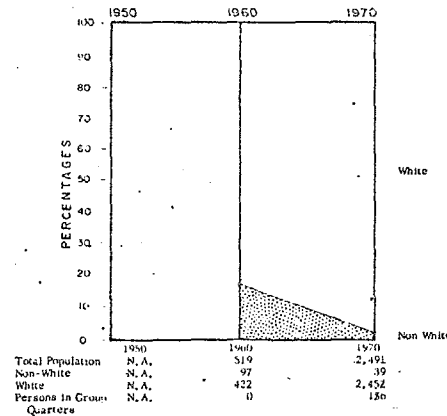
a larger degree of mobility than is usually attributed to it. The pattern in the 65 and over age category parallels that which has occurred for the city. However, the dominant characteristic in this section is the increase of young families into the area.

AURORA HOUSING AND INCOME CHANGES



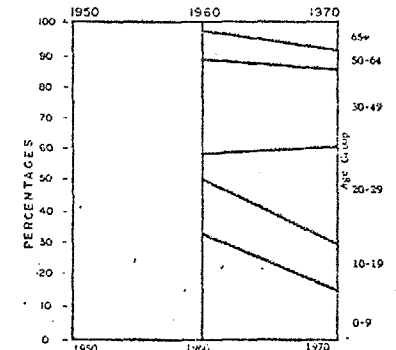
LOWER = Under \$4000
 LOWER MIDDLE = \$4000-\$7999
 UPPER MIDDLE = \$8000-\$14999
 UPPER = \$15000 and over

POPULATION CHANGE BY RACE



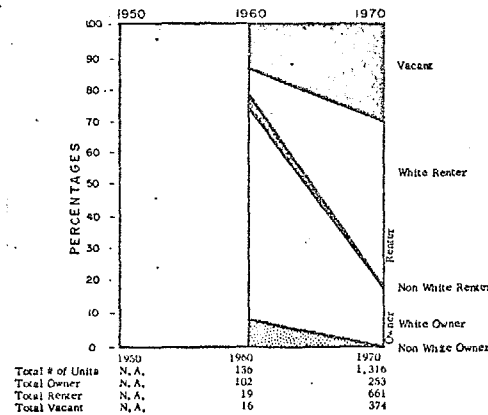
POPULATION

POPULATION AGE GROUP

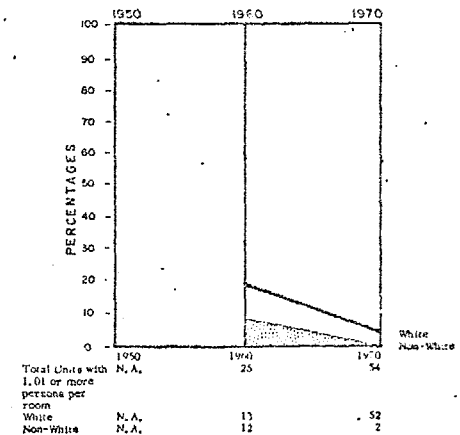


HOUSING

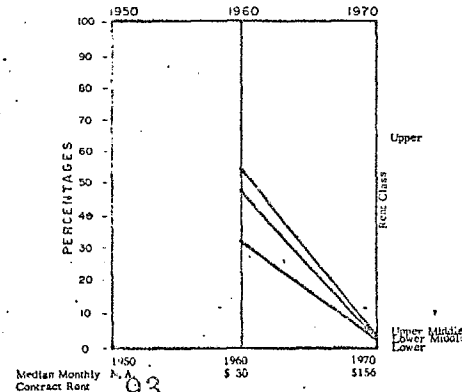
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

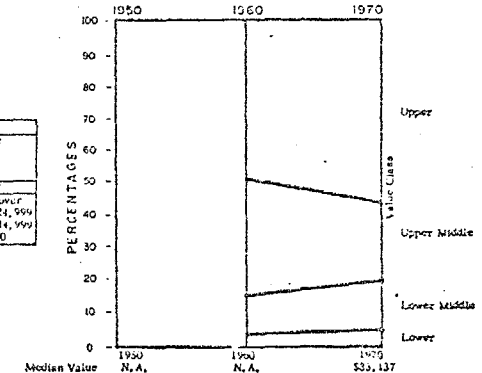


RENT



CLASS	RENT
Upper	\$100 and over
Upper Middle	\$ 80 - \$99
Lower Middle	\$ 60 - \$79
Lower	Under \$60

VALUE OF UNIT



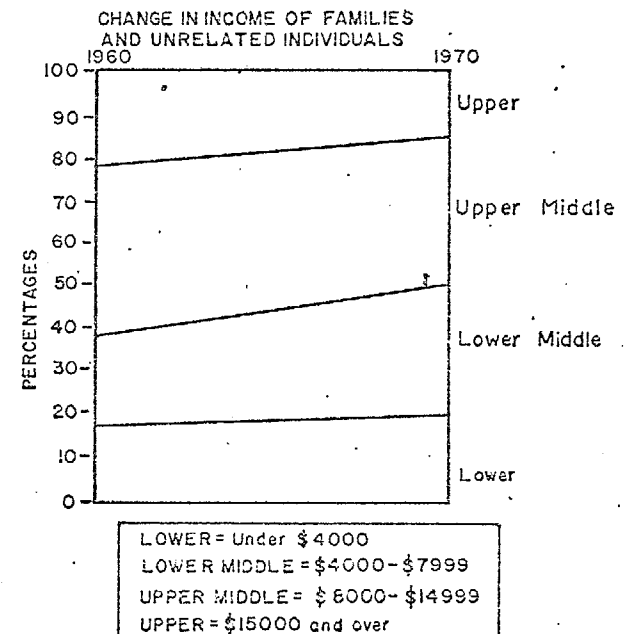
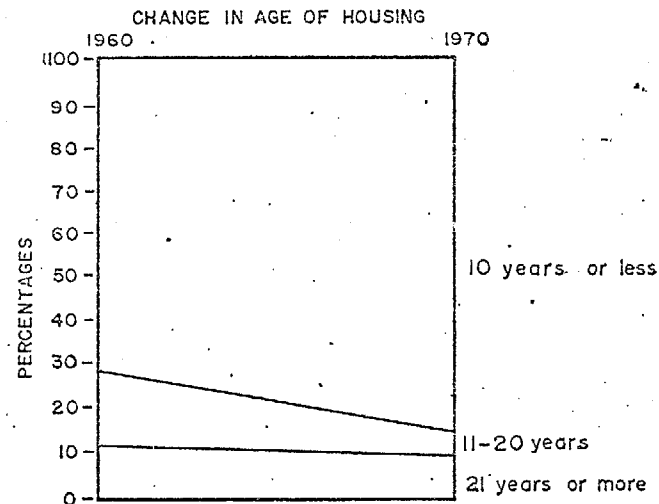
ELMWOOD HOUSING AND INCOME CHANGES

ELMWOOD(Planning Section XV)

Elmwood as well as New Orleans East are two planning sections that began to experience urbanization during the 1960's and will continue to do so at a more extensive rate in future decades. Since the 1950 data was not available and 1960 information was sketchy at best, the changes represented in graphical form will frequently be rather large in comparison to the 1960 figures and somewhat erratic. The total population rose considerably relative to 1960 and this increase was virtually all white persons. The large vacancy rate is probably the result of large numbers of homes and apartments awaiting occupants when the census was taken. Such a pattern is characteristic of developing areas. The decline of nonwhites in the section relates to the reduction of non-white owners and renters both of which approached zero.

Rent and value levels are indicative of the price range of housing that has been developed. The very high increase in monthly contract rent and proportional increase of "upper" classified rental units is a clear indication of apartment construction. The value levels are slightly more complex with increases occurring in the "upper" and "lower middle" groups. Owing to the small number of units in the section, new construction most likely accounted for most of the rise in "upper" classed units and a possible loss of value and some construction may have resulted in the "lower middle" increase.

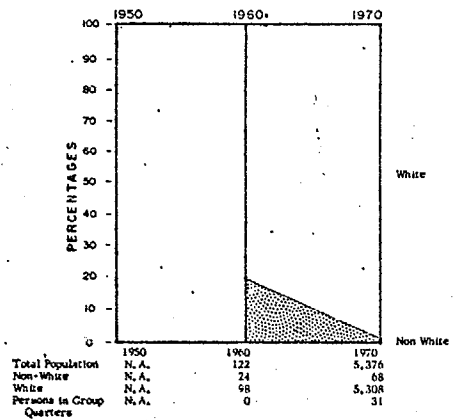
Numerically, all age categories showed population increases but the numbers are relatively small and difficult to analyze. The increase in persons aged 20-29 and 65 and over with a relatively stable percentage of persons 30-49 characterize this planning section. This pattern probably would indicate that young families with children and single persons have moved into the area and that this section is consistent with overall city-wide trends relative to the rise in the number of persons aged 65 and over.



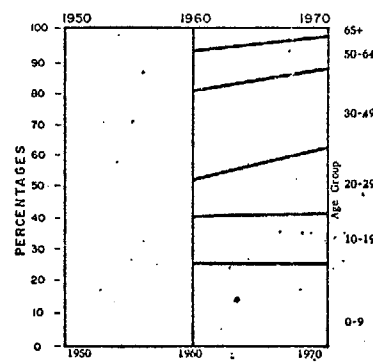
N.O. EAST PLANNING SECTION 16

POPULATION

POPULATION CHANGE BY RACE

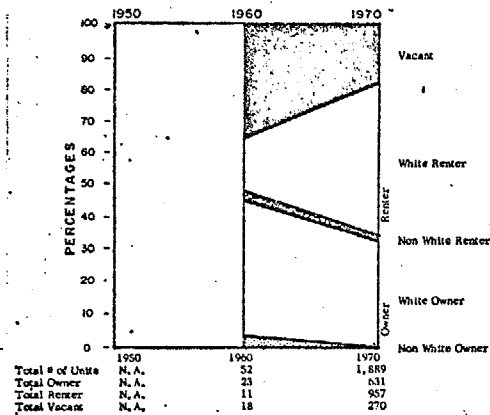


POPULATION AGE GROUP

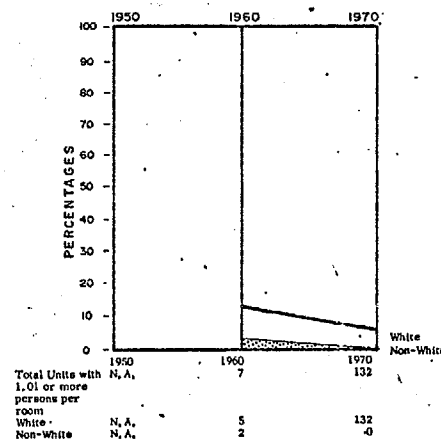


HOUSING

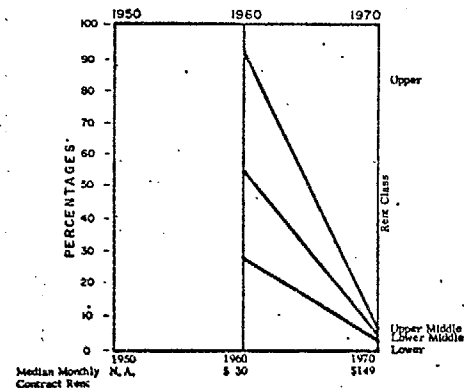
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

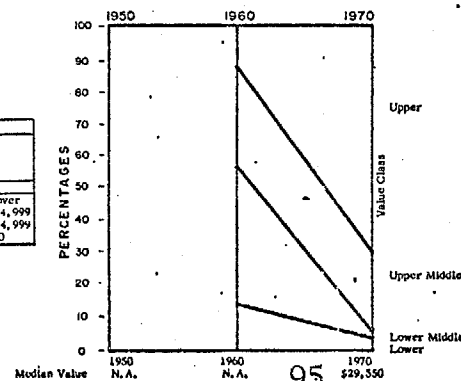


RENT



CLASS	RENT
Upper	\$100 or more
Upper Middle	\$ 80 - \$99
Lower Middle	\$ 60 - \$79
Lower	Under \$60
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

VALUE OF UNIT

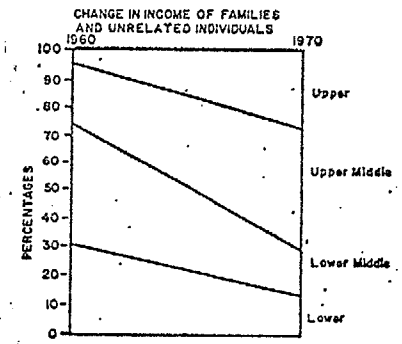
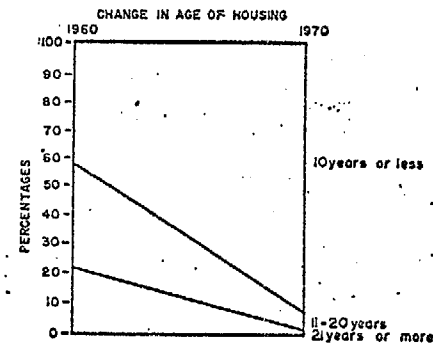


NEW ORLEANS EAST (Planning Section XVI)

This very large planning section has begun to experience sizable population increases in the sixties. The number of white persons has increased substantially. Most of this increased population has been accommodated by new rental units thus decreasing the percentage of total units that are owner occupied. The 1970 figures indicated that the owner occupied category accounted for nearly 34% of the housing stock in this section. In contrast to Elmwood, the vacancy rate declined during the sixties. However, the number of vacant units still included nearly 15% of the housing stock.

A profile of rent levels indicated a large increase in units classed as "upper" which is characteristic of developing areas and is reflected in the rise of median monthly contract rent. Value levels revealed a gain among "upper" classified units and a relatively stable level with regard to "upper middle" value levels. The remaining two categories declined.

The 20-29 population age group showed a percentage increase with other groups remaining fairly stable except for those persons aged 65 and over which declined. This is uncharacteristic of most planning sections in the city.



LOWER	Under \$4000
LOWER MIDDLE	\$4000 - \$7999
UPPER MIDDLE	\$8000 - \$14999
UPPER	\$15000 and over

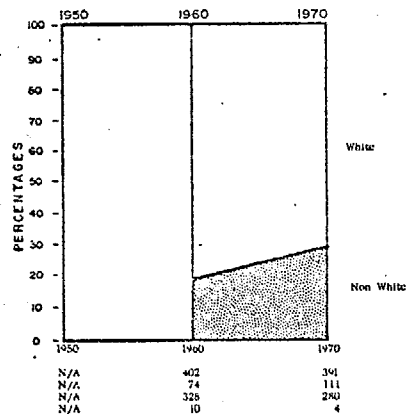
NEW ORLEANS EAST HOUSING AND INCOME CHANGES

LOWER ALGIERS PLANNING SECTION 17

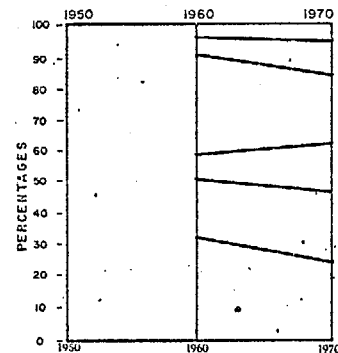
LOWER ALGIERS (Planning Section XVII)

POPULATION

POPULATION CHANGE BY RACE



POPULATION AGE GROUP



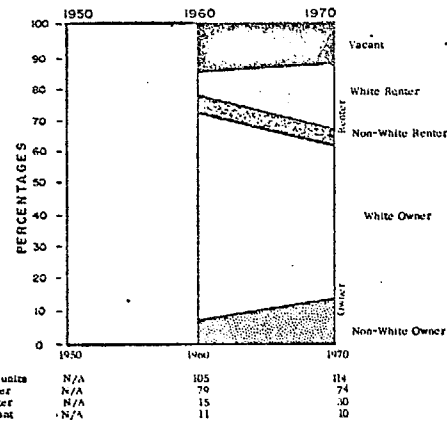
Analysis of this planning section is limited owing to the small number of persons and sparseness of settlement. Much of this area is still inaccessible by road. All data relates only to the period between 1960 and 1970. Total population showed virtually no change but with a slight increase in nonwhite population.

There were percentage increases in both white renter and nonwhite owner occupied units but percentages tend to be exaggerated when numbers are as small as these. Rent and value data indicate a predominance of "lower" and "lower middle" classified owner occupied units. Median values for rent and value are reflective of the rural type housing in Lower Algiers.

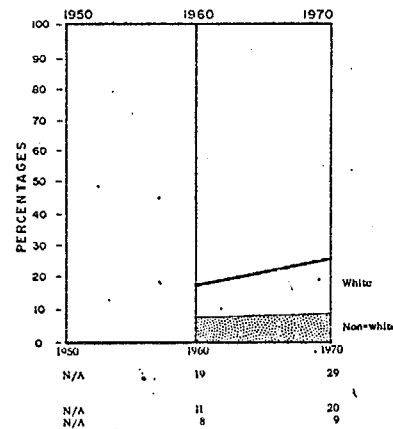
Population age group changes are reflective of only about 400 persons between 1960 and 1970. However, several dominant city-wide trends are revealed even with such a small population. Namely, the 0-9 and 30-49 groups declined and the 10-19 and 20-29 categories showed some increase. There was a very small change in the percentage of persons aged 65 and over which is contrary to many of the other planning sections in terms of its magnitude.

HOUSING

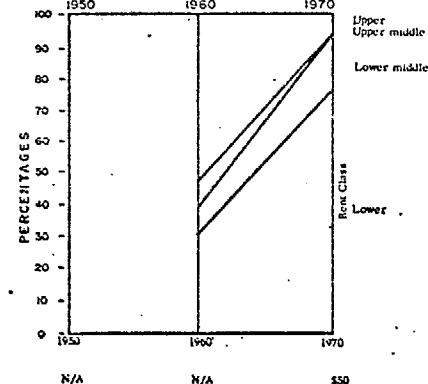
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

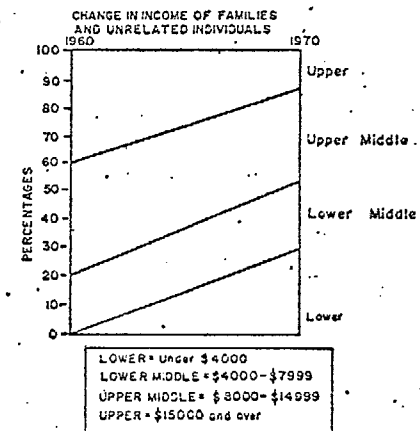
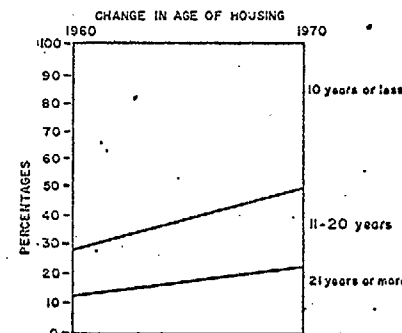
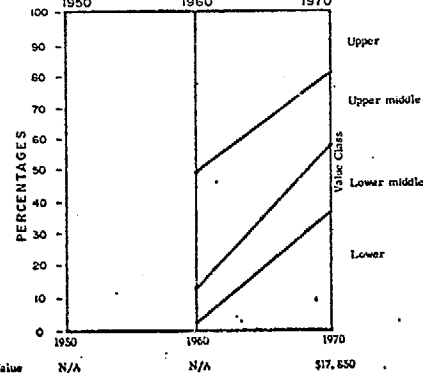


RENT



CLASS	RENT
Upper	\$100 or more
Upper Middle	\$ 80 - \$99
Lower Middle	\$ 60 - \$79
Lower	Under \$ 60
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

VALUE OF UNIT



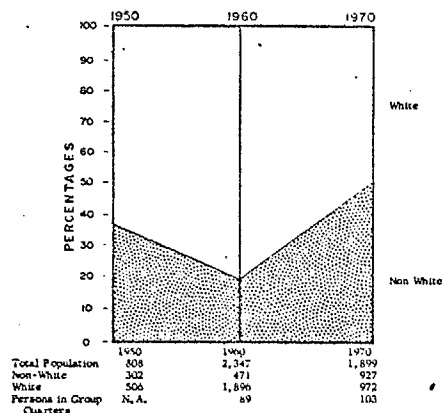
LOWER ALGIERS HOUSING AND INCOME CHANGES

LOWER = Under \$ 4000
 LOWER MIDDLE = \$4000 - \$7999
 UPPER MIDDLE = \$ 8000 - \$14999
 UPPER = \$15000 and over

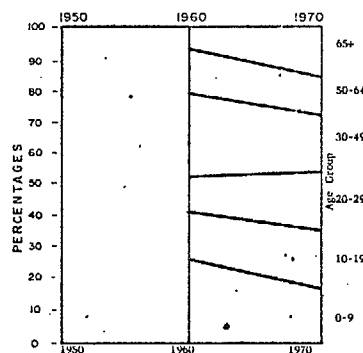
VIAVANT PLANNING SECTION 18

POPULATION

POPULATION CHANGE BY RACE

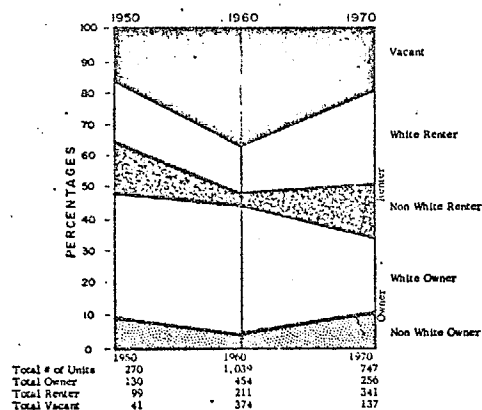


POPULATION AGE GROUP

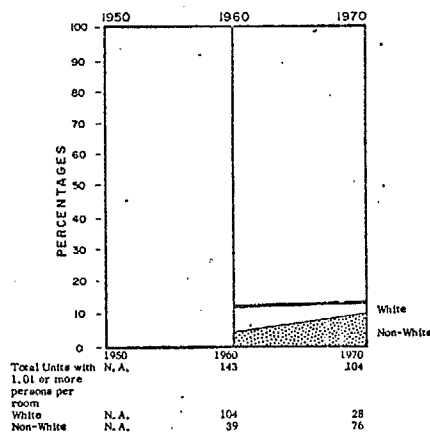


HOUSING

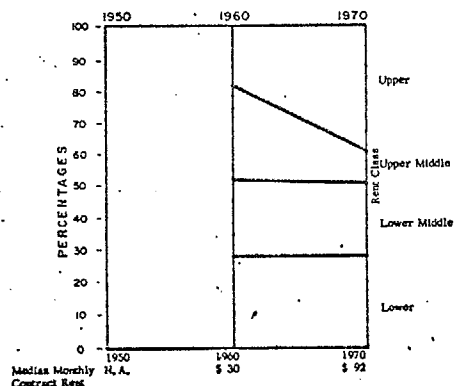
TENURE



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE

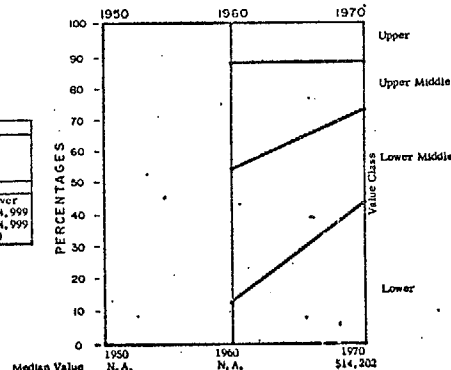


RENT



CLASS	RENT
Upper	\$100 or more
Upper Middle	\$ 80 - \$99
Lower Middle	\$ 60 - \$79
Lower	Under \$60
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000

VALUE OF UNIT



VIAVANT (Planning Section XVIII)

Analysis of this planning section revealed several uncharacteristic patterns in comparison to both older areas (ex. Carrollton) and the newer sections such as New Orleans East and Edgelake. The contrasting land uses and the slow down in activities at Michoud are most likely the explanation for the changes which will be described below. None of the planning units in Viavant is classified as residential and most of the population in the area reside along and near Chef Menteur Highway (U.S. 90). The remainder of the area is industrial and also includes the land expected to be utilized in the relocation of the Port of New Orleans to Centropport along the Mississippi River-Gulf Outlet.

During the 1950's Viavant experienced a population increase. Study of housing and racial patterns during this period indicates that most of these persons were white and purchased homes although the rental unit market also increased. The corresponding rise in the number of vacant units is consistent with this increased demand for housing.

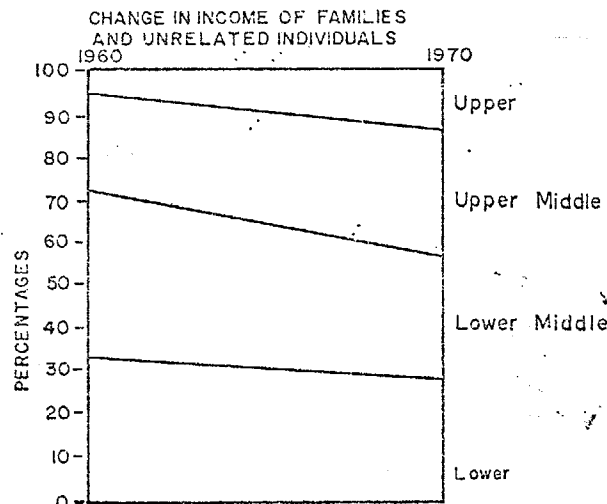
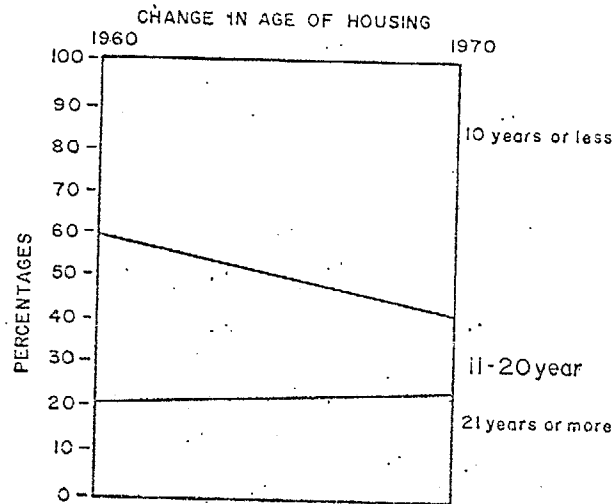
The 1960's saw a reversal in these trends which probably occurred toward the close of the decade. Again, from available data, one could conclude that those persons who left this section were homeowners and largely white. Although white ownership declined during this time, rentership increased among both whites and nonwhites. Nonwhite ownership also increased and the changes in total nonwhite population reflect the increased demand for housing. However, the number of vacant units declined as a result of the slow down in housing activity.

The rent and value patterns provided additional information. Among rental categories, each group remained virtually stable except the "upper" class which increased and therefore caused a decline in "upper middle" classed units. Among values, the "upper" and "lower middle" groups were generally unchanged but the "upper middle" decreased and the "lower" category increased.

Although the number of units with 1.01 or more persons per room declined, the nonwhite percentage increased as the net number of units in this group rose for nonwhites but declined for whites.

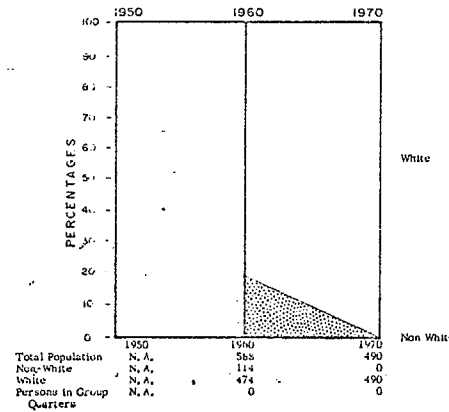
Change among age groups appear to be generally consistent with overall city-wide trends. Declines occurred in the 0-9 and 30-49 age groups. Increases were noted in the 20-29 and 65 and over groups as well as a slight increase in the 10-19 age category.

VIAVANT HOUSING AND INCOME CHANGE



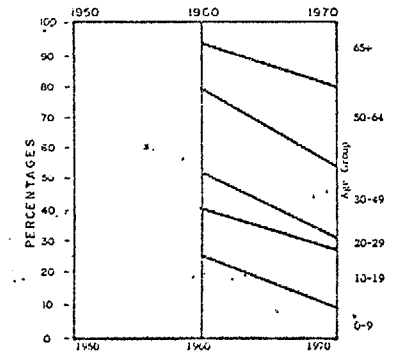
LOWER = Under \$4000
LOWER MIDDLE = \$4000 - \$7999
UPPER MIDDLE = \$8000 - \$14999
UPPER = \$15000 and over

POPULATION CHANGE BY RACE



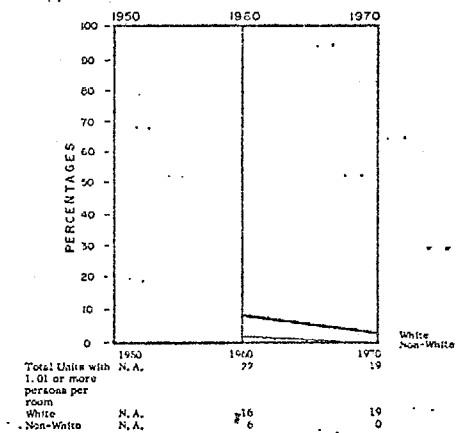
POPULATION

POPULATION AGE GROUP

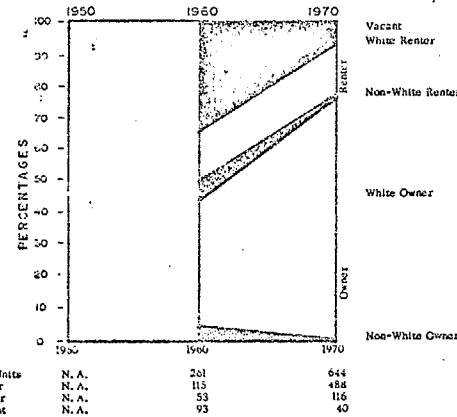


HOUSING

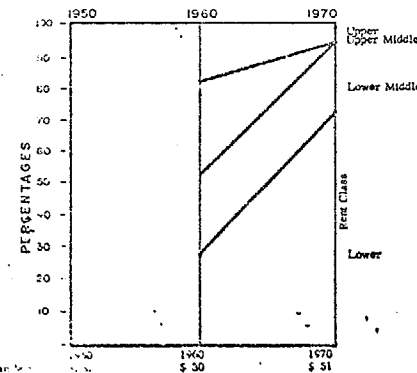
UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE



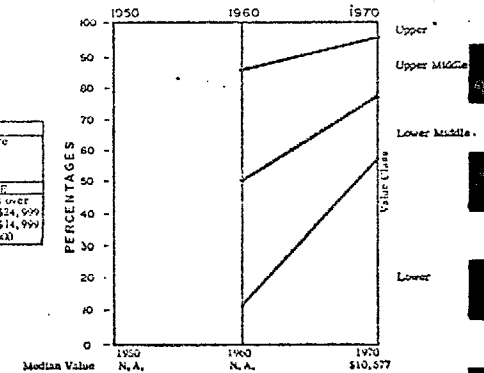
TENURE



RENT



VALUE OF UNIT



CLASS	RENT
Upper	\$1400 or more
Upper Middle	\$800 - \$1399
Lower Middle	\$400 - \$799
Lower	Under \$399
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$15,000 to \$24,999
Lower Middle	\$5,000 to \$14,999
Lower	Under \$4,999

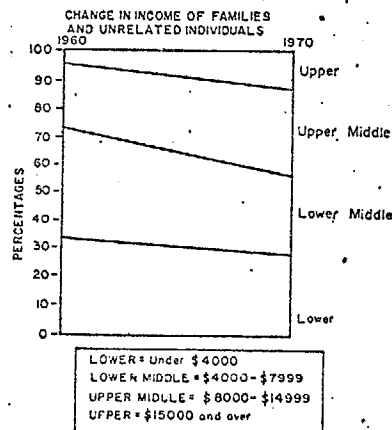
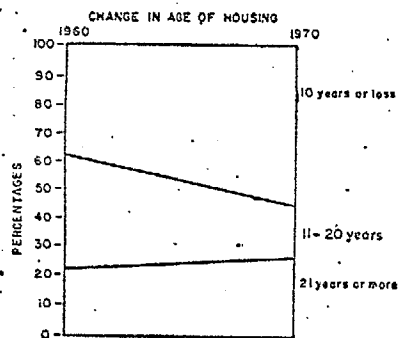
ORLEANS PARISH

CHEF-RIGOLETS (Planning Section XIX)

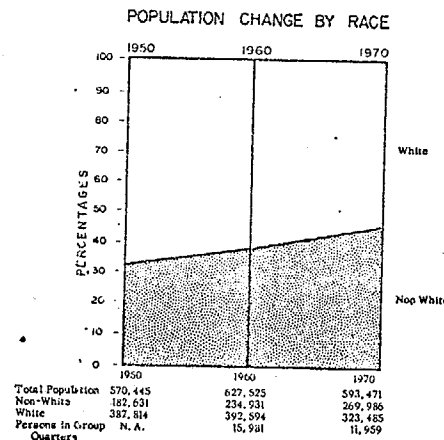
The lack of persons in this section and utilization of many of the units as second residences and homes for fishing camps where residency can be periodic combine to make analysis difficult. The small numbers tend to result in graphical representations that are somewhat erratic.

One of the more important characteristics noted was the total out migration of non-whites in the section. Total number of units and number of vacant units declined but owner occupied units increased. Both these changes were numerically quite small. One reason for the loss of units may have been Hurricane Betsy which, in 1965, caused destruction of units that probably were not rebuilt. In addition, the census definitional change in a housing unit may have eliminated many of these units. Trends among rent and value categories both show substantial increases among the "lower" classified units and decreases in the remaining categories.

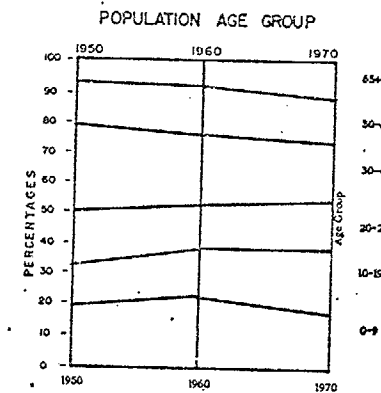
Age group analysis is based upon less than 600 people in 1960 and only 490 persons in 1970. However, gains in the 50-64 and 65 and over groups occurred while losses in the 20-29 and 0-9 categories are revealed in the graph. The loss of persons aged 20-29 is contrary to many of the planning sections in the city but based upon such a small sample, these unusual patterns are certainly quite possible.



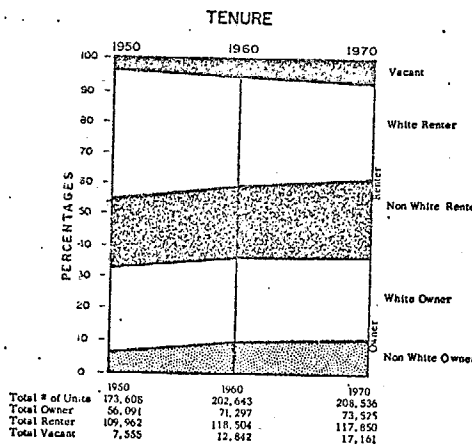
CHEF-RIGOLETS HOUSING AND INCOME CHANGES



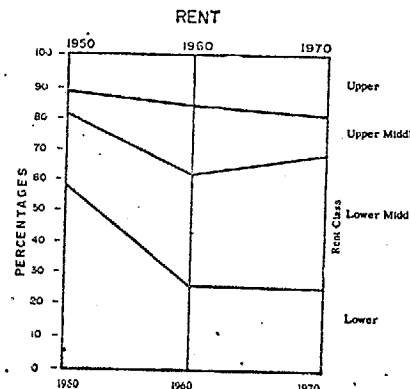
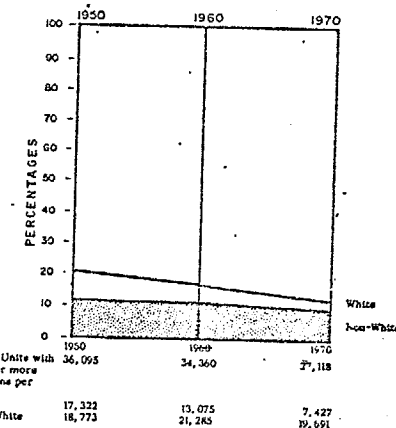
POPULATION



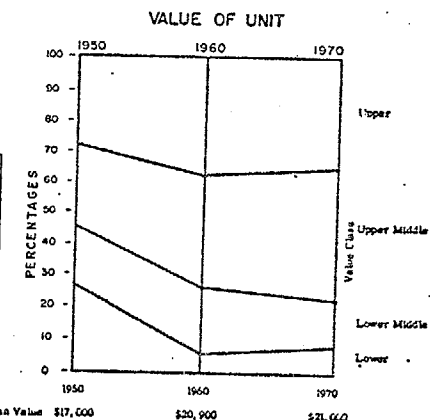
HOUSING



UNITS WITH 1.01 OR MORE PERSONS PER ROOM BY RACE



CLASS	RENT
Upper	\$100.00 and over
Upper Middle	\$80 - \$99
Lower Middle	\$60 - \$79
Lower	Under \$60
CLASS	VALUE
Upper	\$25,000 and over
Upper Middle	\$18,000 to \$24,999
Lower Middle	\$10,000 to \$14,999
Lower	Under \$10,000



Median Monthly Contract Rent \$44 \$61 \$67

Median Value \$17,000 \$20,000 \$24,000

ORLEANS PARISH

The most notable population change in New Orleans from 1960 to 1970 was the net population loss of 5.4%. This was the first population loss recorded in Orleans Parish from one census period to another. This net reduction in total persons reflects a decrease of approximately 68,100 white persons and an increase of more than 35,000 nonwhites. The nonwhite population rose to 45% of the city-wide total. Persons in group quarters declined during the 1960's which is consistent with an overall loss of persons.

Information regarding tenure measures owner, renter and vacant units. The total number of units has steadily increased during the twenty year period of 1950 to 1970 although the greater growth occurred during the 1950's. The further development of the West Bank and East New Orleans probably will increase the growth in new units over the results in the 1960-70 period. One should also note that the increased restrictions on the definition of a housing unit (i. e. complete kitchen facilities including running water was required in 1970 but not in 1960) would have reduced the 1970 total as compared to the 1960 figure. Thus in actuality, there are more units according to the 1960 definition in existence than the 208,536 noted according to the 1970 definition and most of these are poor quality housing. Owner occupied units rose by 2000 and reflect the demand for homes in the expanding sections of the City (West Bank and East New Orleans) as well as some building activity through new construction and renovation in older sections of the City. However, the number of renter occupied units declined by 654 units in the 1960's after a sizeable increase during the previous decade. It is probable that many of the units "lost" by the Census definitional change were rental units and this certainly accounts for some of the loss even though new apartments were constructed especially in developing areas but also sporadically in older planning sections. Renovation also occurred especially in the Lafayette Planning Section and added to the number of available units. Yet, the total number of rental units declined.

The number of vacant units has consistently increased and is the result of newly constructed not occupied on Census Day, sub-standard units unsuitable for occupancy and the normal housing turnover rate. The continuing increase in vacant units is indicative of an active housing market.

Nonwhite renters and owners increased slightly and is reflective of the nonwhite population increase. This trend continues a pattern seen in the 1950's.

Rent profiles for 1970 indicate increases in "upper" and "lower middle" classifications, decreases in "upper middle" classed units and little changes in the "lower" group. The "upper" increase reflects the developing areas and some selective new construction and renovation in the older sections. The decrease in the value of rental property probably accounted for the decrease in rental units from the "upper middle" to the "lower middle" group. The median monthly rent for the City is \$67, which is within the lower middle category.

Value profiles for owner occupied housing reveal slight declines in "upper" and "lower middle" groups with increases in "upper middle" and "lower" groups. "Upper middle" increases probably resulted from both loss of value in units at \$25,000 and over and increase in value of some "lower middle" units to values between \$15,000 and \$24,999. The "lower" increase is most likely the result of the housing "filtering down" process.

Several significant observations can be made about the foregoing population and housing profiles. The trend in white renters since 1960 is one of decline while white ownership has remained relatively stable. This indicates that although white owners in numerous areas may have relocated for a variety of reasons (socio-economic change, opportunity for newer housing, etc.), they have remained in Orleans Parish whereas there was a distinct decline in white renters. Several interpretations about this trend could be made. The most likely possibility for this decline was the availability of much newer apartment housing in Jefferson Parish in a quantity not available in New Orleans as well as a reaction to socio-economic changes in neighborhoods. It is also possible that many renters became home owners in Jefferson Parish. One should recall that the period of time under consideration was prior to much of the new apartment development on the West Bank and in East New Orleans. Thus, this information would appear to dispute a widely-held notion that housing owners leave the city when socio-economic changes affect neighborhoods.

Another characteristic to note is the increase of both non-white renters and owners. Combining this information with the rent and value data which reveal trends toward general increases in apartment rents and housing value for most unit categories, one could conclude that there has been some general economic change in the non-white's ability to afford better housing.

Population age group changes reveal trends that are indicative of most central cities in the country. Increases occurred in the 10-19, 10-29, and 65 and over groups in the 1960's. Decreases were indicated in the 0-9, 30-49 and 58-64 categories. The decline

of persons aged 0-9 is indicative of decreased birth rates in the city and reflects a nationwide trend. An increase in persons aged 65 and over is also consistent with national patterns.

Data units with 1.01 or more persons per room indicated losses in the white population, and minimal changes for nonwhites. The loss in white population in this category is consistent with the overall white population loss and a decrease in density among nonwhites in some sections of New Orleans probably caused the very slight decrease in nonwhite units 1.01 or more persons per room.

Table 14

Summary Of Migration Rates New Orleans SMSA

	1960 - 1970 ¹	1970-1980 ²
Orleans	- 14.9	- 5.5
Jefferson	+ 30.6	+ 13.1
St. Bernard	+ 30.7	+ 20.0
St. Tammany	+ 37.8	+ 21.6
SMSA	+ 2.5	+ 4.1

Sources: 1 Migration in Louisiana 1960-1970, Georgios C. Christou Division of Business and Economic Research, College of Business Administration, Louisiana State University in New Orleans.

2 Population Projections to 1980 and 1990 Louisiana and Its Parishes, Georgios Christou and Harris S. Segal Division of Business and Economic Research, College of Business Administration, Louisiana State University in New Orleans.

Table 15

Planning Sections - City of New Orleans. Summary of Population & Housing Densities.

Planning Section Name and Number	Year	Total Population	Total Dwelling Units	Acreage	Population Density Per Acre	Housing Density Per Acre	Persons Per Dwelling Unit
Lakeview - 1	1970 1960	22792 21350	7941 6584	3750.0	6.1 5.7	2.1 1.8	2.9 3.2
Gentilly - 2	1970 1960	68025 70699	22187 20270	5766.0	11.8 12.2	3.8 3.5	2.1 3.5
Broadmoor - 3	1970 1960	53799 56629	18401 17757	3042.5	18.7 18.6	6.1 5.8	2.9 3.2
Mid-City - 4	1970 1960	83677 106926	31097 35504	4252.8	19.7 25.1	7.5 8.4	2.6 3.0
Bywater - 5	1970 1960	60194 71644	19090 20273	3214.3	18.8 22.1	5.9 6.3	3.2 3.5
Carrollton - 6	1970 1960	30583 33135	10408 10788	1994.7	15.3 16.6	5.2 5.4	2.9 3.1
University - 7	1970 1960	54784 62172	20969 21015	2432.0	22.5 25.6	8.6 8.6	2.6 3.0
Lafayette - 8	1970 1960	62814 76670	25505 28016	1862.4	33.7 41.2	13.7 15.1	2.5 2.7
Central Business District - 9	1970 1960	25962 37625	12234 15596	1639.5	15.8 23.0	7.5 9.5	2.1 2.4
Downtown - 10	1970 1960	32907 33002	9454 8637	1559.3	21.1 21.2	6.0 5.5	3.5 3.8
Edgelake - 11	1970 1960	16751 7333	5255 2510	4550.4	3.7 1.6	1.2 0.6	3.2 2.9
East Gentilly - 12	1970 1960	20374 13152	5536 3871	4162.8	4.9 3.2	1.3 0.9	3.7 3.4
Algiers - 13	1970 1960	29812 25486	9809 7630	2470.1	12.1 10.3	4.0 3.1	3.0 3.3
Aurora - 14	1970 1960	20020 8329	5777 2193	2258.8	8.9 3.7	2.6 0.9	3.5 3.8
Elmwood - 15	1970 1960	2491 519	1316 136	2160.6	1.2 0.2	0.6 0.0	1.9 3.8
New Orleans East-16	1970 1960	5376 122	1839 52	39693.9	NA NA	NA NA	2.8 2.3
Lower Algiers - 17	1970 1960	391 402	114 105	4777.3	NA NA	NA NA	3.4 3.8
Viavant - 18	1970 1960	1899 2347	747 1039	6382.1	NA NA	NA NA	2.5 2.3
Chef-Rigolers - 19	1970 1960	490 588	644 261	24868.2	NA NA	NA NA	0.8 2.3
Orleans Parish	1970 1960	593471 627525	208536 202643	42546.5 (a)	13.9 14.7	5.0 4.8	2.8 3.1

(a) developed area in 1966 - City's total area is 120337.7 acres excluding water

Note: (1) Acreage for planning sections represent total land area including vacant land but excluding water.

(2) Planning Sections with NA generally have only a small percentage of the area developed and statistics for pop/acre and du/acre would be distorted. Partial acreage figures for these Planning Sections were unavailable.

(3) Density figures based upon gross acreage including streets and non-residential land uses.

Table 16

Summary Of Population Projections For Parishes
In The New Orleans S M S A

Parish	1970 Census	July 1, 1972 Census Estimate	Projection 1-D*		Projection 2-D*		Projection 3-D*	
			1980	1990	1980	1990	1980	1990
Orleans	593,471	589,000	557,062	535,932	611,186	630,934	647,044	700,690
Jefferson	337,568	367,600	555,316	917,018	439,127	570,532	388,110	441,987
St. Bernard	51,185	54,000	84,489	137,391	71,196	97,816	59,332	67,623
St. Tammany	63,585	66,000	108,160	194,413	88,855	127,770	73,051	84,538
S.M.S.A.	1,045,809	1,076,600	1,305,527	1,784,754	1,210,364	1,427,052	1,167,537	1,294,838

*Projection Key: 1-D = Net Migration Constant at 1960-70 Rate and Birth Rates Constant at 1970 Levels

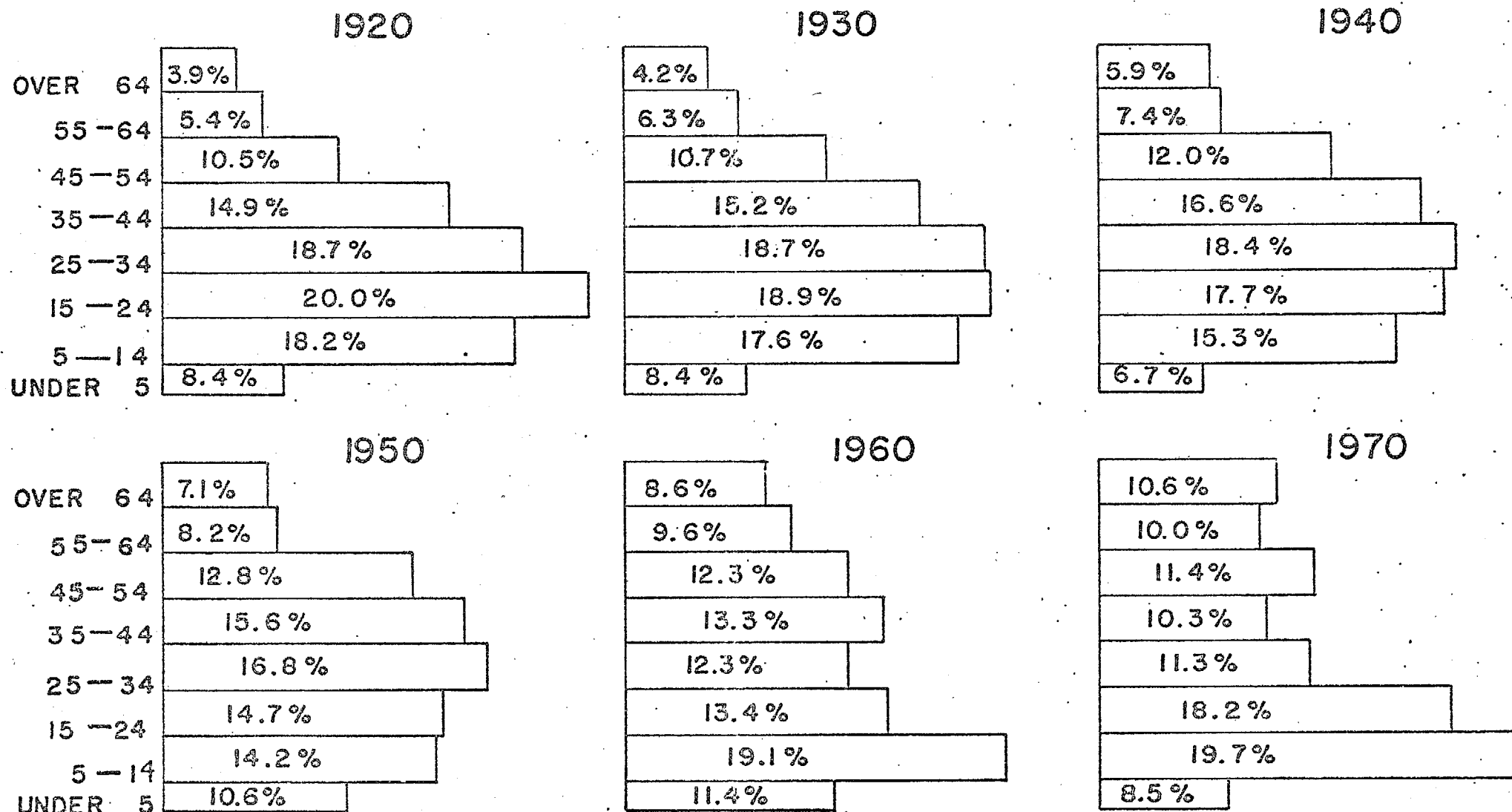
2-D = Assumed Net Migration Rates for 1970-80 and Birth Rates at 1970 Levels

3-D = Zero Migration and Continuation of 1970 Birth Rates

Sources:

Bureau of the Census, Department of Commerce (for 1970 figures and 1972 estimate)
Louisiana State University in New Orleans, Division of Business and Economic Research,
College of Business Administration Population Projections to 1980 and 1990, Louisiana and
Its Parishes by Georgios C. Christou and Harris S. Segal (for Projections)

NEW ORLEANS POPULATION BY AGE GROUP 1920-1970



SOURCE: U.S. BUREAU OF THE CENSUS CITY PLANNING COMM. APRIL 1972

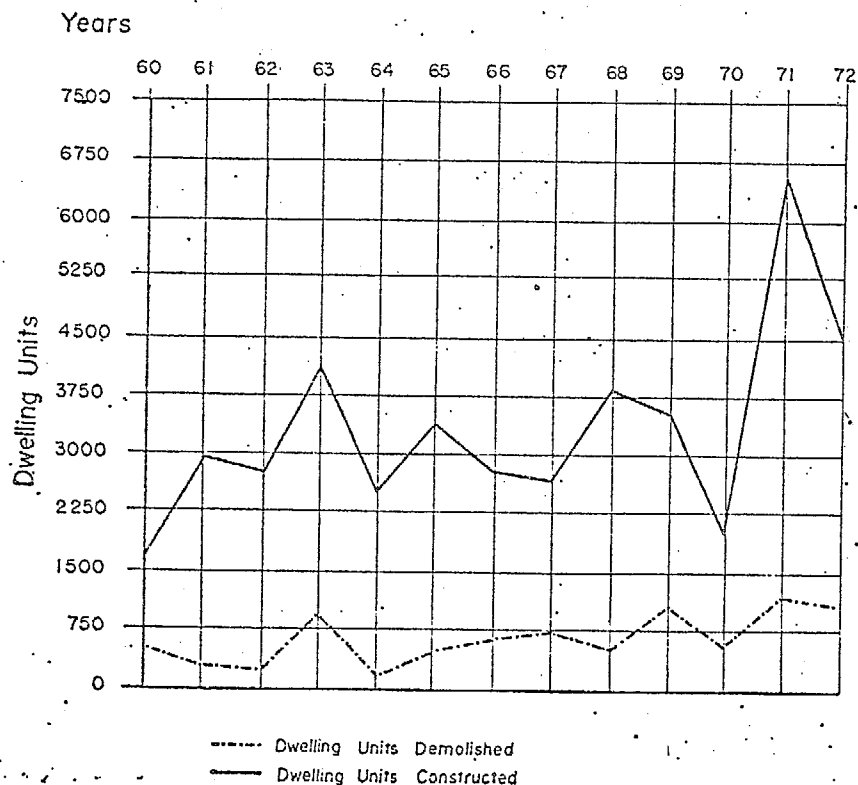
The following figures graphically present a summary of construction activities in the City of New Orleans for the years 1960-1972:

The first renders a comparison of dwelling unit demolitions and constructions.

The second compares figures for the construction of single, double, and multi-family dwelling structures.

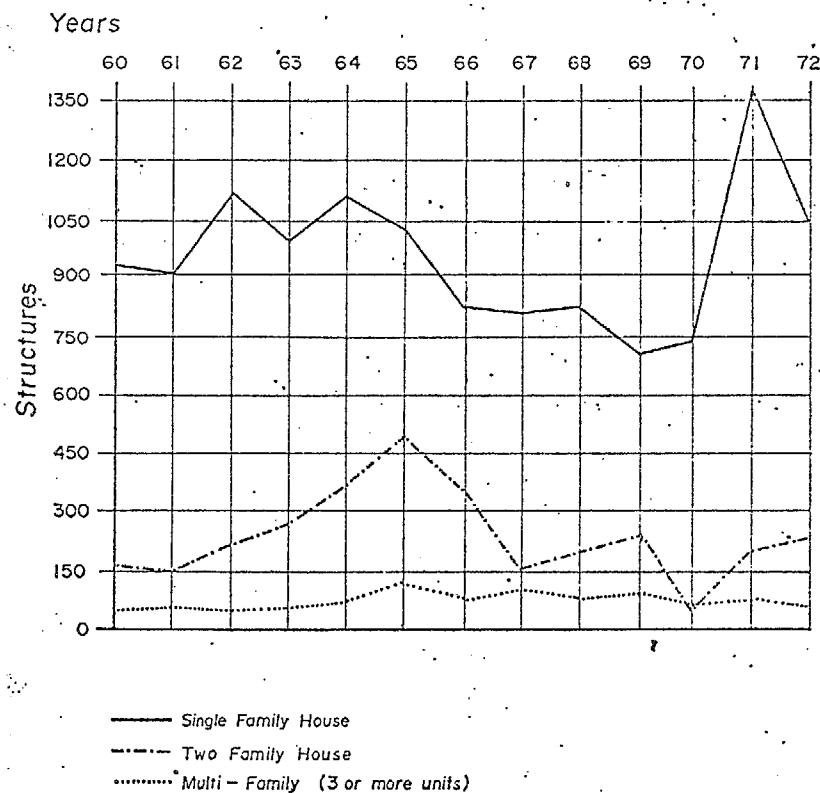
The third compares figures for the construction of dwelling units in single, double and multi-family structures.

Demolition and New Construction Activity in New Orleans 1960-1972



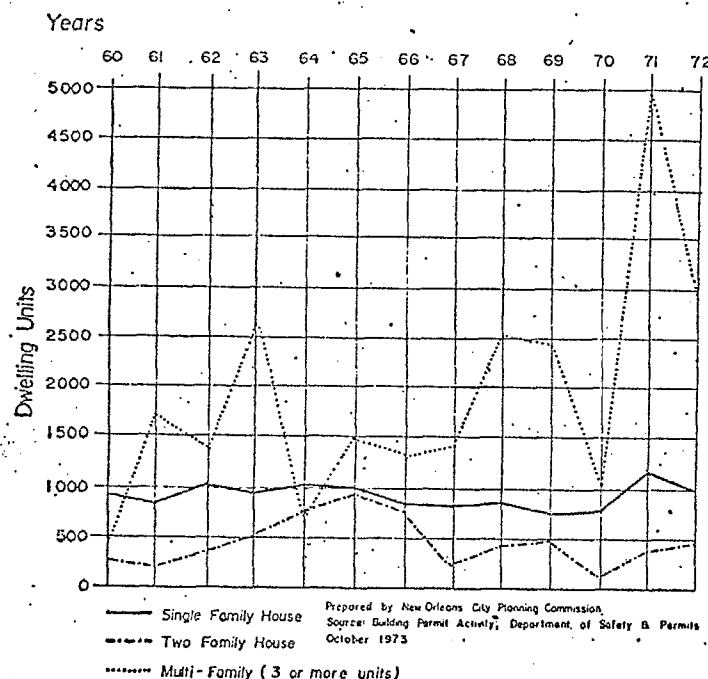
Prepared by New Orleans City Planning Commission
October 1973
Source: Building Permit Activity, Department of Safety & Permits

Profile of New Residential Construction in New Orleans 1960-1972 (Structures)



Prepared by New Orleans City Planning Commission
October 1973
Source: Building Permit Activity, Department of Safety & Permits

Profile of New Residential Construction in New Orleans 1960-1972 (Dwelling Units)



Building Permit Graph Analysis:

Several clear peaks of building activity can be noted from analysis of dwelling units in 1963, 1965, 1968 and most notably, in 1971. The substantial increase in permits for 1971 is probably a reflection of the beginning of full scale construction in Eastern New Orleans and a continuation of building in the West Bank of Orleans Parish, especially in Aurora and Elmwood. Dwelling unit demolition occurred most notably in 1963, 1969 and 1971.

In terms of structures, single family units predominate with peaks in 1962, 1964 and 1971. Note that there was a major upswing of two family units up to 1965 followed by a rapid decline which has never been recovered.

Dwelling unit profiles by type are most revealing regarding construction activity. Multi-family units predominate especially in 1963, 1968 and 1971 although that type of construction fell appreciably in 1964. Two family dwelling activity has been consistently slower than single or multi-family units especially in 1971. The trend toward multi-family units is generally consistent except in 1960 and 1964.

Comparison of Orleans Parish with Selected Other Cities and Parishes in the Metropolitan New Orleans Area

Many central cities within metropolitan areas have experienced large scale population changes during the past years. Generally these cities have lost their white middle class residents to suburban developments surrounding the central city usually for such reasons as lower taxes, better schools, lower crime rates and newer residences. Although these population losses have now been occurring since 1950 in primarily older northern central cities (ex. the City of St. Louis has lost 234,000 persons in 20 years). New Orleans did not experience such a loss until the 1970 census revealed that the city had lost 5.4% of its population since 1960. New Orleans has not followed the pattern of many cities of its age and size because of several unusual factors in its historical development. The New Orleans Area was restricted physically in its expansion by Lake Pontchartrain, Mississippi River and the abundance of marshy areas except along ancient river beds or ridges where land was high enough for settlement. Therefore, early growth occurred primarily along the banks of the Mississippi River and along the Esplanade, Metairie and Gentilly Ridges. By 1950 when other cities were beginning to lose population, much of New Orleans' lakefront area and marshy areas to the east of the Industrial Canal were undeveloped. In the developed parts of the city there was no large scale movement of any size to suburban areas and an unusual pattern of residential integration of housing values and race existed. The impact of the Federal Interstate Highway program has also been of major significance and the delay in New Orleans participation until rather recently contributed to a continuation of this residential pattern. However, the construction of the Mississippi River Bridge, development of Veterans Memorial Highway and the Jefferson Parish section of Interstate 10 increased access to the east bank of Jefferson Parish as well as the Algiers-Aurora-Elmwood sections of New Orleans in the 1950's and early 1960's. Therefore, conditions now had developed for large numbers of persons to live elsewhere than in the older sections of the east bank of Orleans Parish and maintain a reasonable level of transportation services. This capability for movement outside of Orleans Parish is reflected in the city's first loss of population over a decennial period.

This part will attempt to examine changes in the composition of population that have occurred in Orleans Parish and other parishes within the metropolitan area and compare these statistics with several other cities. Several areas of concern

will be studied including analysis of the changes occurring in the population of the working force, persons under 5 years, and the elderly. The data in the study is limited to net population by age category and sex. However, from this information one can examine changes in certain age groupings and, given particular needs that would be associated with those groups, project the kinds of city services that would be necessary. For example, nationally, as well as in New Orleans, a trend has developed toward a reduction in persons under five and an increase in elderly persons. These population trends raise certain difficult questions regarding number and type of schools and playgrounds. If the number of school age children continues to drop should the school board consider selling or altering the school sites in the city? Should playgrounds be redesigned to serve a more passive recreation activity which would be characteristic of most elderly persons? Would NORD have to consider developing new kinds of programs for older persons assuming a declining number of younger persons participating in their athletic programs? These and other questions are some of the important issues that can be raised based upon knowledge of population changes.

The comparisons of Orleans Parish to the total New Orleans Metropolitan Area, other parishes in the SMSA, and other selected central cities should provide a measuring tool for Orleans Parish to examine the extent of population changes and their impact relative to other locations and the role that New Orleans population composition plays in the metropolitan area.

Use of Population Pyramids

A population pyramid is a graphic representation of population age categories by sex and is a common technique utilized to examine population changes. For this study 1970 Census figures were developed for five year intervals up to age 64 by sex. All age categories above 64 were combined to create the "65 and over" listing. Each age interval was then graphically portrayed on the vertical axis. The horizontal axis portrays population values in equal intervals that exceed the greatest value for any of the population listings. It is also best, if possible, to use consistent population values for each pyramid although this can be difficult when comparisons of other cities are made.

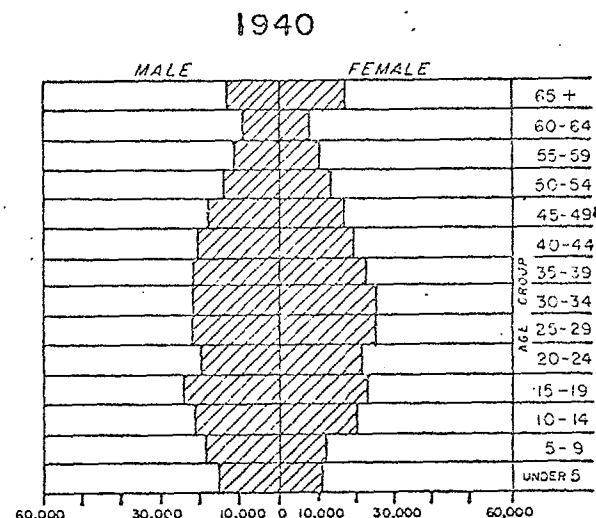
By overlaying one pyramid over another information can be portrayed about the relationship of particular age groups in different parishes and in metropolitan areas. Certain information about city services can be developed based upon the

percentages of a particular age group that one parish has in relation to the metropolitan area given knowledge of the needs of a particular group.

Population Changes in Orleans Parish Since 1940

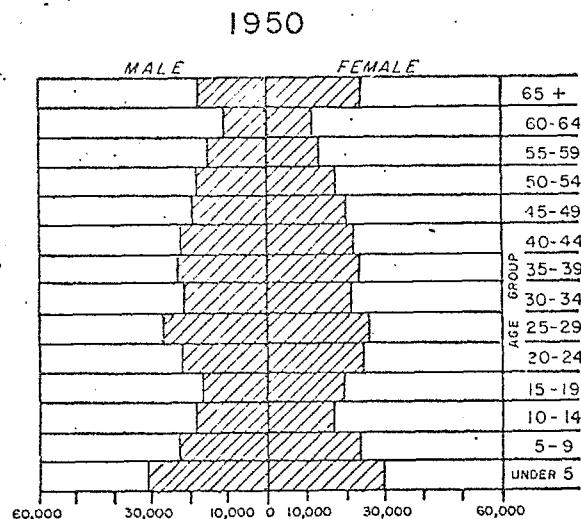
This part provides some graphic illustration of population pyramids over decennial periods since 1940. Generally New Orleans has followed nationwide trends in central cities except that the accelerated pace of net population losses which has occurred in other cities did not begin to appear here until 1970. However, within individual age groups, the past four census have revealed constantly shifting age categories.

ORLEANS PARISH
POPULATION PYRAMID
TOTAL POPULATION BY AGE & SEX



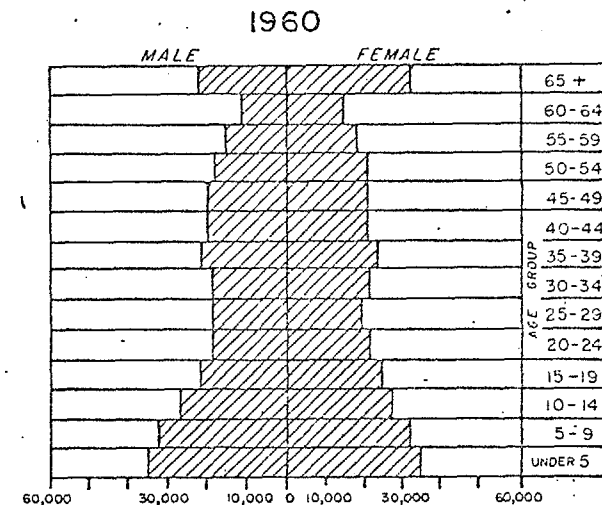
Note that in 1940 the largest age categories for women were between 25 and 34 while males between 15 and 19 tend to predominate. There is an absence of a large number of persons under 5 making the base of the pyramid appear remarkably similar in form to the 1970 pyramid. At this period of time the majority of the population was found in the primary working age categories of age 20 to 49. The relatively small percentage of persons age 65 and over (2.3% male - 3.6% female of total) in relation to the total population in 1940 is in marked contrast to changes that were going to occur.

ORLEANS PARISH
POPULATION PYRAMID
TOTAL POPULATION BY AGE & SEX



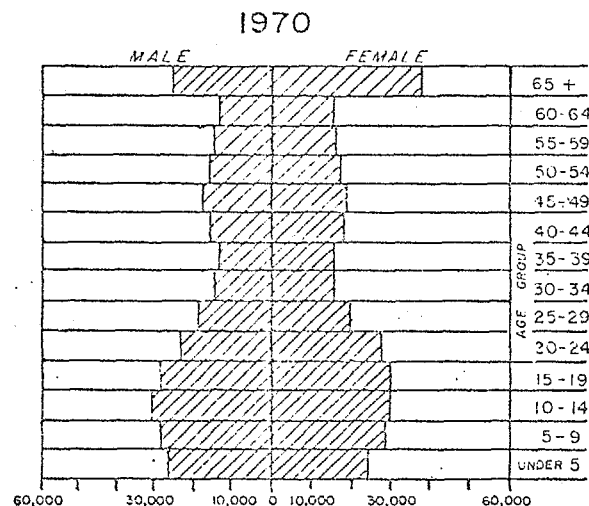
By 1950 the effects of the "post war baby boom" were beginning to appear. The number of persons under five had increased by 27,027 persons or 81.7% since 1940 and had become the largest group of any age category. The second largest group of persons were those between 20 and 29 so that the school age population (ages 5-19) was a relatively small proportion of the total compared to 1960 and 1970. The general proportional distribution among the working age population of 1940 had given way to a disproportionate number of persons in the younger subgroups (ages 20-29). The number of elderly persons had increased from 28,993 in 1940 to 40,700 in 1950 and represented 7.1% of the total population in 1950. For many central cities 1950 marked the last census that a population gain would be recorded.

ORLEANS PARISH
POPULATION PYRAMID
TOTAL POPULATION BY AGE & SEX



In 1960, the census revealed essentially a continuation of trends begun in 1950. The effects of the post World War II and Korean War "baby boom" (i.e. birth increases following both wars) further increased the ranks of the "under 5" category. However, among females age 65 and over, this category had become the second largest. The elementary schools during the 1950's began to feel the effect of the increasing post-war population and the character of the pyramid assumed a "pyramid like" base which, although begun in 1950, had further "solidified" in 1960. The largest number of persons in the working age categories were now between ages 30 and 39. Increasing longevity was revealed in a 32.9% increase of persons 65 and over since 1950. Elderly persons represented 8.6% of the population while the student age population (ages 5-19) had risen to 26.2% of all the persons in Orleans Parish.

ORLEANS PARISH
POPULATION PYRAMID
TOTAL POPULATION BY AGE & SEX



The most recent census revealed a return in some age categories to the characteristics of the 1940 pyramid especially in a decreasing number of persons under five. In 1970 that number had declined 29% over 1960. Over 46% of the population was under 24 with the greatest number of persons between the ages of 10 and 19. These persons were primarily the post war babies reaching high school and college age. The largest number of persons within the working age population was between ages 40 and 49.

Special emphasis should be given to both the loss of persons under five and gain in the number and percentage of elderly persons. Two factors generally resulted in the reduction of persons under five—a declining birth rate and a movement out of Orleans Parish.

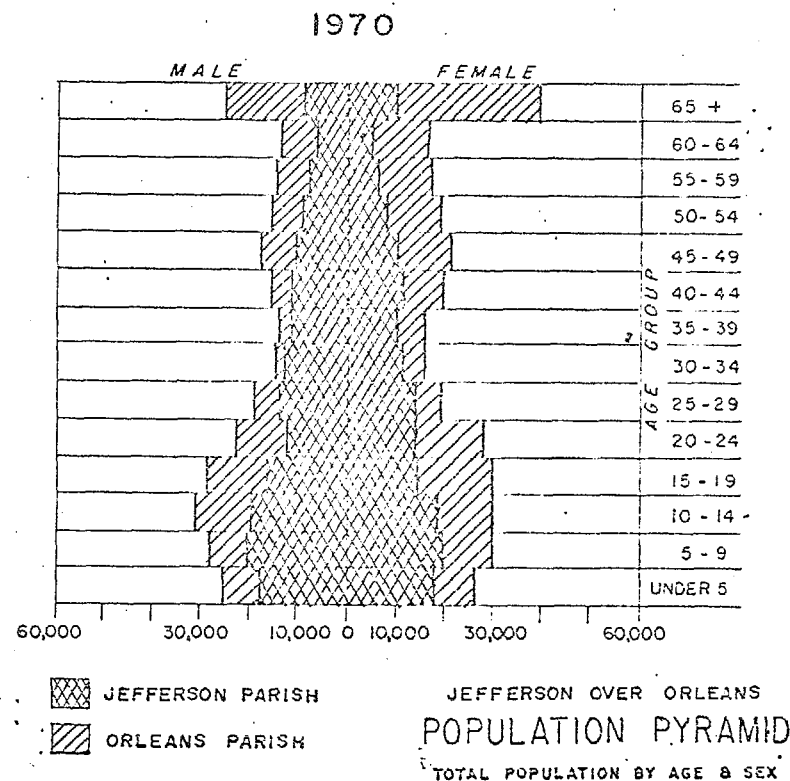
Both these factors were the primary explanation for population losses in other central cities but a movement from New Orleans although it occurred in 1960 was overshadowed by an overall increase in population. The 1960 situation did not occur again in 1970. Note that in 1960 there were 75,960 persons between the ages of 20-29. By 1970 these persons (now age 30-39) had declined to 57,068 persons for a 24.9% loss. These are most likely the individuals who began their

families during the 1960's. Therefore, this factor combined with the loss of persons under five (note the similarity in percentage loss for each group) would lead to a conclusion that generally young families with children were the principal persons who left the city. Profiles of 1970 pyramids in adjoining parishes will help to reveal where many of these persons now reside.

It is important to note that this brief history of population movement in Orleans Parish reflects national trends of most older central cities within metropolitan areas. Yet, the process of migration from the city was only in the formative state in the New Orleans Area in 1970 and may continue.

Comparison of Orleans Parish and Jefferson Parish

Special interest in the relationship between Orleans and Jefferson Parishes' population is important for most of the suburban growth outside of New Orleans has been in Jefferson Parish and to a much lesser extent in St. Bernard and St. Tammany Parishes. An overlay of the Jefferson Parish pyramid over Orleans Parish pyramid is presented below:



One should recall that Jefferson Parish's population was 337,568 compared to Orleans Parish's 593,471. For the younger age categories (under 24) New Orleans shows a clearly greater percentage of persons than in Jefferson Parish. Note that there is roughly an even distribution between males and females in these groups. There is also a decline in the number of persons under five in both parishes which is characteristic of a nationwide trend. The greatest differential among those persons under 24 is in the 19-19 and 20-24 age categories which indicates the large number of young adults as well as college age students residing in the central city.

The age groups from 25-39 show a decreasing differential between Orleans and Jefferson Parish. It is especially important to note that the number of males from age 30-39 in Jefferson Parish nearly approaches the number of males for those age groups in Orleans Parish even though New Orleans has almost 75.8% more persons than Jefferson Parish. This is a major segment of the working age population and indicates a loss in New Orleans' working population and a portion of the tax paying public.

This close alignment of both parish age groups indicates the major age categories that have left New Orleans in favor of Jefferson Parish. One would postulate that these are the parents of the children under five years that have left Orleans Parish. In the upper age ranges, New Orleans again returns to a disproportionate number of persons compared to Jefferson Parish and a clear increase of females over males begins to appear. This trend reaches a peak with persons age 65 and over where the highest disproportion of any age group appears.

Jefferson Parish has 4.9% of its population age 65 and over compared to Orleans Parish's 10.6%.

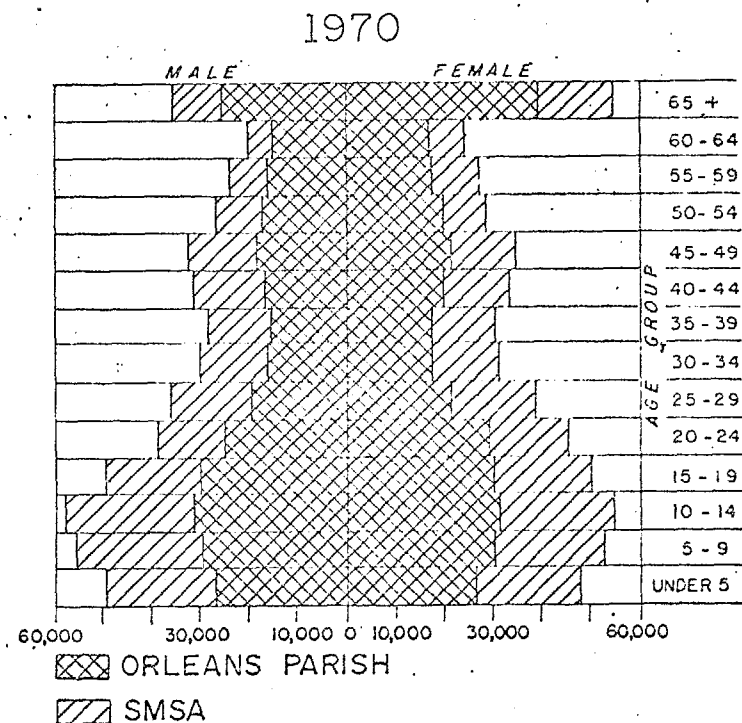
Comparison of Orleans Parish to the SMSA

Orleans Parish occupies approximately 56.7% of the SMSA's population. Generally, the relationship between the age groups for both the SMSA and Orleans Parish are similar resulting in a likeness among the two pyramids. The percentage relationships, however, do reveal differences. Utilizing the overall Orleans Parish percentage of all persons in the SMSA as a guideline, the age categories with the lowest Orleans percentage of the SMSA are males between the ages of 30 and 39 with 48.4% residing in New Orleans. This information again substantiates the probability that during the past ten years migrants from New Orleans to adjacent parishes were part of the working age popu-

lation and included families with children. The population age groups with from 50% to 54% Orleans share of the SMSA total of all persons in each group include all categories of persons under 14, between ages 25-29, females age 30-39, and males ages 40-44. Additional age groups below the Orleans Parish share of 56.7% include males age 45-49 and females 40-44. The remaining categories exceed the city percentage of 56.7%. These groups include persons age 15-19, 20-24 and all categories of individuals above 45, except males 45-49. The Orleans Parish percentage of each age interval as a part of the SMSA above 45 increases until age 65 and over represent 70.5% of the SMSA population 65 and over. This information reflects the larger percentage of older persons in the central city as well as a substantial number of young adults (15-24).

ORLEANS OVER SMSA POPULATION PYRAMID

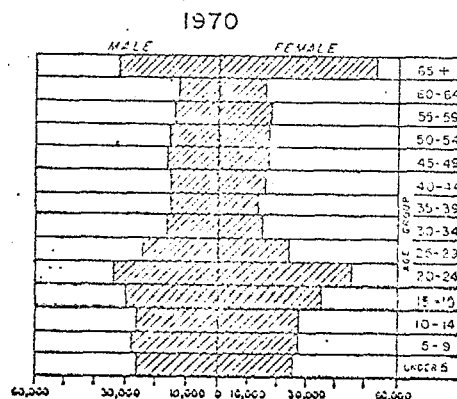
TOTAL POPULATION BY AGE & SEX



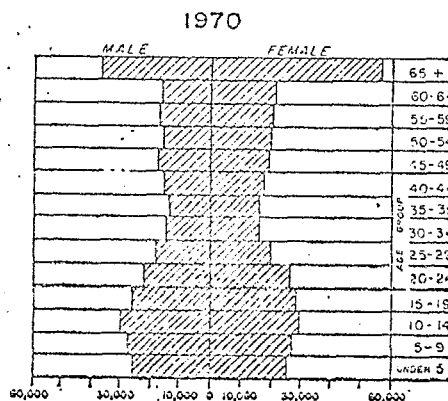
Population Pyramid Comparisons of Orleans Parish with Selected Cities

To attempt to understand the 1970 New Orleans population profile it is useful to compare the statistics with several other central cities. Four cities were selected for comparison - Boston, St. Louis, Atlanta and Houston. Both Boston and St. Louis were chosen as representatives of older northern cities whose numerical population is generally similar to New Orleans. Each has lost population resulting in a 1970 Census population of 640,671 persons in Boston and 622,286 persons in St. Louis. These figures compare favorably with New Orleans population of 593,471. Atlanta and Houston are two southern cities which have experienced consistent population increases and are not representative of cities which have undergone substantial out-migration. The figure below profiles the Boston and St. Louis population pyramids with New Orleans again presented for direct comparison.

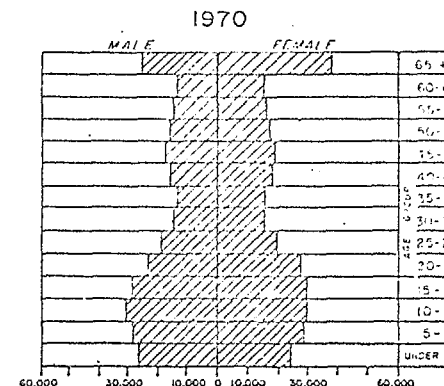
CITY OF BOSTON
POPULATION PYRAMID
TOTAL POPULATION BY AGE & SEX



CITY OF ST. LOUIS
POPULATION PYRAMID
TOTAL POPULATION BY AGE & SEX



ORLEANS PARISH
POPULATION PYRAMID
TOTAL POPULATION BY AGE & SEX



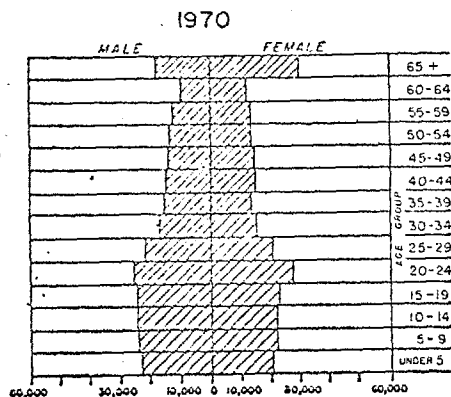
Note that, generally speaking, the population profile of New Orleans is similar to St. Louis but different than Boston. In Boston, the influence of a large number of college students is reflected in the 15 to 24 age categories. There are also slightly more persons under 14 in New Orleans than in Boston. However, the profile of persons from ages 30-64 is not significantly different in either city and the number of persons 65 and over tends to predominate in both cities. Note that in Boston 12.8% of the population is over 65 compared to New Orleans' 10.6%.

St. Louis does not have the disproportionate number of college age persons that Boston has so the population pyramids for St. Louis and New Orleans are more similar. It is interesting to observe that, although St. Louis has lost a large proportion of its 1960 population (27.3%) and New Orleans has only recently began to show a net population loss, the profiles for each city are still quite similar. The declining birth rate is undoubtedly one reason for this similarity. However, a close analysis of the St. Louis pyramid reveals a larger number of persons age 55 and over than in New Orleans, whereas,

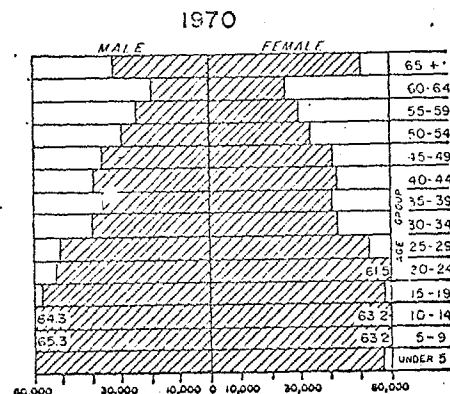
the other age groups are similar in both cities. One could conclude that the St. Louis profile represents the residual effect of a substantial movement of younger persons from the city keeping in mind that the original population of that city was over 856,000 in 1950. In 1970 the percentage of persons age 65 and over was 14.7 compared to 10.8% for New Orleans. Therefore, St. Louis has developed a similar population profile as New Orleans but its extent of loss of population has been much greater. It is conceivable that a continuing loss of persons in New Orleans will result in a larger proportion of the population above age 55 as has occurred in St. Louis but the development potential for New Orleans will play an important factor in the trend.

Atlanta and Houston have each incurred population gains and their profiles along with the 1970 New Orleans Pyramid are presented in the figure below.

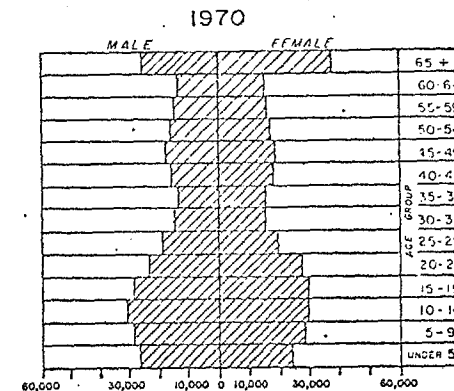
CITY OF ATLANTA
POPULATION PYRAMID
TOTAL POPULATION BY AGE & SEX



CITY OF HOUSTON
POPULATION PYRAMID
TOTAL POPULATION BY AGE & SEX



ORLEANS PARISH
POPULATION PYRAMID
TOTAL POPULATION BY AGE & SEX



Both cities reflect a declining birth rate. However, in Atlanta there is a greater degree of consistency in the population of the age groups under 24 with the exception of females age 20-24. As in Boston, a larger number of college students may have affected this age category for the Atlanta pyramid. This situation contrasts with New Orleans especially comparing the number of persons between the ages of 10-14 and the smaller number of persons under five. Also, note that the profile of the New Orleans pyramid after 35-39 shows increases between ages 40-49 before resuming a decline to age 64. In Atlanta after age 35-39 the profile remains consistent between ages 40 and 49 and then declines to age 64. Otherwise, there is little difference in the pyramid of the two cities. There is a slightly less percentage of elderly persons in Atlanta (9.1%) than in New Orleans (10.6%) and virtually no difference in the percentage of persons under five. Therefore, there is little substantial difference between the two pyramids.

Although Houston's population is substantially larger than New Orleans its population profile is also not significantly different than New Orleans. There is a slightly higher percentage (+ 0.9%) of persons under five in Houston than in New Orleans but a smaller number of elderly persons in Houston (6.4%) compared to New Orleans' 10.6%. There is also a smaller percentage of persons age 60-64 than in New Orleans and a slightly higher percentage of persons 20-24 in Houston. Other than these percentage differences the pyramids for persons from 5-14 and from 40-49 appear to be characteristic of both cities and reflect the overall similarity in both cities' population profiles.

Implications

The information discussed thus far has been limited to data for age and sex. The general nature of this data tends to constrain the substance of any conclusions that might be drawn. However, given knowledge about a particular age group's needs and trends that appear to be occurring, one can examine the effect upon the city's ability to collect certain taxes, operate and construct schools, recreation programs, playgrounds, welfare administration, health programs, etc. A discussion of this material can lead to an understanding of the overall city's relationship to the Metropolitan Area in terms of growth and shifts in population. In a more specific context this data relates to a determination of demand for services, shift in type of services and leads to a conception of an ideal distribution pattern for those services.

For example, the loss of young couples with children would appear to be one of the most clearly discernable trends that could be derived from the data. There was an especially large decline in males age 30-39, which makes up an important part of the working age population. This group represents a potential loss of both property taxes and sales taxes (the city's primary source of revenue). Persons in this population group, if now living in rental units represent potential homeowners and sources of property tax revenues for the city would now be channeled to adjoining parishes. In addition, the "purchasing power" of the city's population is reduced because younger persons with children who would normally spend money on goods and services in Orleans Parish would now spend this money elsewhere reducing sales tax revenues. This sector of the tax paying public who would leave the city would tend to increase the proportion of persons living in the city who are tax absorbers requiring greater demands upon city services.

Regarding the public school system, based upon the declining birth rate as well as a loss of younger persons due to the movement of families with small children, the school board will have to assess the enrollment situation especially in its elementary schools. Possibly consolidation of several elementary schools attendance areas could become advisable as well as consideration of finding other uses for school buildings such as providing evening classes for adults or allowing community groups to use the facilities. Another alternative is sale of particular school buildings. The actions of the Archdiocese of New Orleans in closing parochial schools due to attendance shortages provides a more short range example of the consequences of this population trend.

Recreation programs and playground design would have to place special emphasis upon serving the high school and college age groups as well as the elderly. In areas where a substantial decline in younger persons may occur, playgrounds could be made available for older persons activities while health and welfare programs would not only have to be expanded but more outreach services provided since transportation becomes an important factor especially for elderly persons.

A related problem that is indirectly indicated from the statistics is an unbalanced use of "city assets" by metropolitan area residents. The increasing population in adjoining parishes still generally depend upon New Orleans for recreational and cultural activities such as City and Audubon Parks, New Orleans Theatre for the Performing Arts and Museum of Art. In addition, the City of New Orleans supports much of the employment sites for many of the metropolitan area residents. According to the 1970 Census 72.5% of persons in the metropolitan area work in Orleans Parish.

Both the use of "city assets" by outside residents and the growing inability of city residents to pay for services which leads to increased cost of services would indicate a need for more tax and service equity on a metropolitan basis. One such approach is establishment of a "cultural district" to support cultural institutions from a primary tax source whose burden would fall equally upon the metropolitan area.

Thus, this report should help to provide an indication of some kinds of problems that the City of New Orleans will face based upon movement of population and other factors in the metropolitan area. It should also help to place the City in perspective as to how its population changes compare with a selection of other large cities. It is hoped that the illustrations of these comparisons will generate more thought and eventually strategies to face these changes.

Summary

Every urban area is unique in that each has its own site and situation, and each experiences its own peculiar development pressures. This section brought into perspective the population trends and development pressures now being experienced in New Orleans.

While the population of the city has decreased since 1960, increasingly more land comes under development each year. An understanding of this phenomena is necessary in order to

forecast the future extent of developmental pressures and to identify those areas most likely to be developed in the near future. With this information in hand, planners can anticipate and control development to ensure that it does not conflict with the quality of the environment and the viability of valuable estuarine eco-systems. Development has historically been limited to natural levee areas; it was not until recent technological methods for reclamation were introduced that development extended into wetland areas. Realizing the hazards of development in these areas, the City of New Orleans has taken steps to retain the residential viability of the inner city through the undertaking of an Urban Design Study which, when implemented will make New Orleans a more attractive urban living environment.

Already developed areas of the city are easily identified. Currently under developmental pressure is the New Orleans East planning section. While a significant portion of this section is contained marsh, there are several open marsh areas where development must be strictly controlled or prohibited. An identification of these areas and the proposed mechanism for their control and management is contained in Volume II.

7 Economic Conditions

New Orleans is a part of the coastal region and is ensconced amid rivers, bayous and lakes. Historically these water resources have been, and remain, a mainstay of the economy and lifestyle of the City. From the time the area was formed man has lived in the coastal zone and directly supported himself from it. The diet of ancient Indians for example, consisted largely of clams (*Rangia cuneata*) found in abundance in the brackish waters of Lake Pontchartrain and Borgne. Later Indians traded the pelts of marsh animals found in the coastal zone.

One of the primary determinants for establishing New Orleans on the banks of the river near Lake Pontchartrain was the fact that this area was a natural portage heavily used by the Indians in their trade. Here, too, was a plentiful supply of marsh animals for food and furs.

Trapping became one of the first "industries" in the New Orleans area. At one time trapping was a significant occupation, however the alteration of the marsh habitat and encroaching population sprawl has accelerated the demise of trapping as an important industry.

The Mississippi River provides the City of New Orleans with its drinking water supply and supports largest industry, the port. This port is the second largest in the United States and third largest in the world in value of foreign commerce and total water borne commerce handled. This importance can be realized in that it has been estimated that 20% of the local employment force is considered "port dependent".

Additionally, the river, coastal bayous and related waterways such as the Gulf Intracoastal Waterway provides the port and the nation with a cheap and convenient means of transportation and communication.

The total 1973 value of the Public Port Cargo Tonnage was \$19,192,000,000*. Port Foreign Commerce tonnage was 31,636,000 tons with 21,954,000 tons being Foreign Export Tonnage and 9,612,000 the Foreign Import Cargo Tonnage.

The value of the Foreign Import Commerce was \$1,754,000,000 and the Foreign Export Commerce \$3,562,000,000 bring the total value of Port Foreign Commerce to \$5,316,000,000.

* This and the majority of the statistics presented in this section were obtained from the Chamber of Commerce, New Orleans Area, 1974.

Other transportation facilities in the New Orleans area include its airport terminal facilities, the major of which is New Orleans International Airport. From the operation of the 14 airlines it is estimated that there were 2,210,801 passenger arrivals in 1973 and 2,202,723 departures.

Banking is a major business in the New Orleans area with many large financial institutions beginning operation here in the last ten years. In 1973 total assets of the 32 commercial banks exceeded \$4.6 billion.

Commercial bank deposits were \$3,622,721,000. Commercial bank loan values was \$2,381,370,000. The debit value was \$53,115,288,000 and commercial bank clearings was \$26,383,110.

The Savings and Loan and Homestead assets in 1973 was \$1,442,693,000. The value of loans issued in 1973 was \$1,230,412,000.

The effective buying income of the New Orleans area is \$4,389,805,000 with the per capita effective buying income estimated at \$4,021. The volume of retail sales is \$2,615,602,000 with \$282,463,000 of this being the volume of department store sales.

Ranking high as one of the area's major employers is manufacturing which employs over 50,000 persons, with a payroll in excess of \$113 million. Shipbuilding constitutes a major portion of the area's manufacturing industry. While shipbuilding has not grown at the expected rate it contributes to the city's economy by employing 12,000 persons with an average wage of \$202 per week.

Construction employment and activity is a major contributor to the area's economy. Direct construction employment in 1973 was 28 thousand persons and the value of construction contracts was \$416,764,000. The value of residential contracts was \$236,560,000 and the value on non-residential contracts was \$180,204,000.

A major area industry which ranks high in terms of per employee wages paid is mining (oil and gas). This industry employed 13,800 persons in 1973 with an estimated payroll value of over \$76 million.

In 1967 New Orleans had 1,366 wholesale establishments employing 20,728 workers, payrolls totaled \$132,955,000 and sales totaled \$2,722,800,000.

Retail establishments in New Orleans totaled 5,006 with sales of \$1,029,135,000, employed 4,456 and had total payroll of \$137,795,000.

1971 per capita income in New Orleans was \$3,881; total personal income equalled \$4,125,000,000.

Another important factor in considering the economic value of the coastal zone, but one which is difficult to document monetarily, is the attractiveness of the coastal zone as a place to live. Greater New Orleans is the largest populated area of the state with a total of 1,092,000 persons. According to Louisiana Wetlands Prospectus prepared by the Louisiana Advisory Commission on Coastal & Marine Resources (1973), 24% of the projected state population increase will be in the coastal zone with a significant percentage being located in the New Orleans area.

The Coastal Zone is also attractive as a place to visit. According to the New Orleans and Louisiana Tourist Commission, 4.4 million visitors come to the area every year. In 1973-74 visitors spent \$326.6 million dollars making tourism a leading industry of the area. The flow of tourists provides a year round employment base which dramatically increases during Mardi Gras.

The new Superdome with an anticipated maximum capacity of 80,000 persons is expected to act as a further stimulus to the tourist industry. It is designed as a multi-purpose facility with the flexibility to accommodate events which range from rodeos to ballets. The Superdome has accelerated the growth of new motels and hotels and the new 12,000 room Hyatt Hotel will be the largest in the Hyatt chain. The New Orleans Marriott Hotel is also the giant of the Marriott chain with an expansion planned in the near future.

Officials of the city have noted the rise in tourism during the last ten years and are taking measures to insure that those areas and buildings which are of interest to tourists be preserved. The French Quarter is protected on the federal level as a National Historic Landmark and a National Historic Place. In addition, the locally appointed Vieux Carre' Commission has a stringent code of rules governing activities in French Quarter building and renovation.

In order to preserve the historical integrity of the city, New Orleans officials are creating Historic Preservation Districts throughout the entire area, not merely in tourist oriented

places. The preservation of many fine old buildings in the Central Business District will assure that New Orleans will maintain its identity rather than become a stereotype downtown area so common to many large cities. Many older neighborhoods may be designated as historical districts and their residents may gain insight as to the historical value of their property and be encouraged to maintain it as a vital part of the city's character.

Today tourists travel into the outlying neighborhoods in greater increasing numbers as knowledge of older architectural periods becomes more widespread and the appreciation of these periods is increased, thus both the tourism industry and residents alike will benefit from sound conservation.

Likewise, surrounding bayous and swamps are increasingly attracting the interest of tourists which has resulted in an increase in the tour boating industry. However, there remains a lack of recreational facilities in these areas.

Paralleling and equally important to the water transportation aspect of water resources is the seafood industry. Attempts were made to collect sufficient data to establish a direct correlation between the myriad of New Orleans restaurants and their link with the multi-million dollar tourism industry. Such a relationship has not been possible to document within the scope of this report for a variety of reasons, however, many indices point to a probable correlation which should be documented.

A random survey of restaurants show that many of the most popular have a menu composed of approximately 75% seafood. The quantity and regional origin of the food is difficult to determine because these restaurants buy through processors as well as directly from the fisherman.

Seafood (crabs, shrimp, fish, oysters) is a basic product of the New Orleans coastal region. However, due to marketing practices it is one of the most difficult industries for which to establish statistics. Those referred to are preliminary figures compiled by the National Marine Fisheries Association in 1973 for Louisiana.

The Association points out that while the documented seafood landings (total fisheries caught including crabs, shrimp, menhaden, oysters, etc.) are not within the confines of Orleans Parish, the life cycle of the sea animals depends upon the interrelationship of the waters within and surrounding Orleans

Parish. Tarver (1972) refers to Lake Pontchartrain as the largest contiguous estuarine area in the coastal zone of Louisiana.

At a recent federal hearing on proposed development projects, Dr. John Day (1974), testified that the Catherine-Borgne estuary accounts for 25 per cent of Louisiana's total annual fisheries catch of 1.2 billion pounds. He further stated, "more than one half of the food the fish and shellfish live on is derived from organic material released by wetlands fringing the lake".

This estuarine area (the waters of Lakes Pontchartrain, Borgne and Maurepas, and Breton Sound) yielded a catch of 20,500,953 pounds valued at \$4,984,834. In September 1973 alone the catch from Lake Borgne was valued at \$420,000, half of which was oysters.

Gosselink, Odum, and Pope (1973) in a study of marshes estimated that seafood processing increases the dockside value of fisheries by 75%. This would place the aggregate value of the 1973 Maurepas-Pontchartrain-Borgne catch at \$37,386,255.

There are those who would question the statistics compiled by the various agencies on the number of landings; however, if anything, the landings are probably higher rather than lower. The Louisiana Wildlife and Fisheries Commission estimates that possibly 1/3 of the oyster crop is not accounted for because only those oysters commercially handled are noted. Over 1/2 of the crop is sold by sack by the individual fisherman.

Oysters represent a particularly valuable commodity in the area's seafood composition because it has the extraordinary ability to cleanse itself of pollution. In January, 1973, the eastern portion of Lake Pontchartrain became extremely polluted and it was necessary to remove the oysters located there if they were to be a utilized resource. A successful experimental oyster transfer was made with the cooperation of the fishermen and the Louisiana Wildlife and Fisheries Commission. It was reported that approximately 65%-75% of the original catch was recovered during harvesting.

In 1973 there were fourteen firms in the area involved in canned, cured, fresh and frozen seafood. These firms ship throughout the United States and also act as agents for imported seafood products.

A basic industry of Lake Pontchartrain is shell dredging; hundreds of pounds of predominately fossilized Rangia cuneata

clam are taken from the lake each year. In a report by Johnnie W. Tarver (1972), it is estimated that the clam industry has a value of \$40 million dollars. Partial cost breakdown shows \$18.7 million worth of equipment, \$4.0 million payroll to 510 employees who live in parishes surrounding the lake; \$10.1 million in purchased services; \$2.0 million in taxes. While the bulk of the industry depends on fossilized shell and the industry in today's form has a limited future, replenishment is important to prolong what is presently an important contribution to the area's economy. Replenishment depends on major disturbance occurring in the clam's environment.

One of the benefits of living in the coastal zone is the availability of water and marsh areas for recreation. Recreation is a great economic factor in the New Orleans coastal region, but like the relationship between tourism and seafood, it is difficult to document. There are approximately 17 boat dealers within the city and 54 within the area.

1973 motorboat registrations indicate that 32,328 motorboats over 10 horsepower are in the area. The area's two major marinas can accommodate approximately 1000 boats; there are an equal number on their waiting list (this includes sailboats).

Utilizing the results of a cursory survey it has been conservatively estimated that an average weekend fisherman spends approximately \$10 a day for bait, supplies, food and gas. Hypothetically, three people per boat fishing three times a year would have an estimated bare expenditure of \$90, excluding the cost of boat rental which could range from a skiff to a 65' yacht. Also excluded is initial equipment purchase which could range from a cane pole to a sophisticated assortment of rods and reels.

If half (15,000) of the registered motorboats fish in the surrounding waters three times a year with 3 persons aboard the expenditure is \$1,350,000. Interviews with persons involved in the service and supply business indicate that this estimate may be conservative. One outlet for gas and supplies contacted has an average spring/summer business of 400 boats per Sunday.

In Louisiana Wetlands Prospectus, a report by the Louisiana Advisory Commission on Coastal and Marine Resources, it is estimated that coastal recreation, considered as an industry, ranks third to the mineral and agricultural industries. The report continues, "other economic values of coastal zone recreation are not always recognized. Those include money brought into localities by non-residents attracted by the recreational opportunities; increased attractiveness of the coastal zone for certain types of

labor, intensive business because the coastal zone is a desirable place to live, and business opportunities through direct service to recreationists, e. g. sales of paraphernalia of outdoor recreating, boating, etc.". (p. 267)

The economic value of the New Orleans Coastal Zone must be assessed from a variety of viewpoints and bases : those that are directly and indirectly related to the coastal zone and those whose worth is both tangible and intangible. All share a common dependence, that is, that the current condition of the New Orleans Coastal Region will not be radically altered.

The economic value of tourism in New Orleans is prime and is directly related to the fact that the area is in the coastal zone. The ancient settlement which attracts millions of tourists each year was located at the bend of the river most satisfactorily situated to take advantage of many properties of the coastal zone. 4.4 million people visit New Orleans per year creating a \$436 million dollar industry, the city's fastest growing. Tourist promoters state that there is a need of more family oriented activities and have expressed interest in various outlying parks and recreational and historical areas. The potential for increasing tourism, as well as local employment strongly exists in an expansion of water oriented activities. Efforts should be made to have a better exchange of information between government agencies in relation to tourism as well as between the trades and government agencies.

An area sorely needing documentation is the relationship between the seafood industry and tourism. Those in the tourist trade, natives and visitors, will state that seafood plays a large part in New Orleans' popularity, but documentation is not available at this time. Primary research is needed to answer a number of questions such as: What percentage area of restaurants depend on seafood as a major menu item? What is the method of acquiring seafood and, could this be made more efficient? How much of the seafood comes directly from the coastal zone surrounding New Orleans? Is the availability increasing or decreasing?

A cursory examination has indicated another important assumption which should be explored: general agreement that most tourists prefer fresh, local seafood, such as trout, crabs, and shrimp, however because of rising domestic prices many of the major restaurants are having to convert to frozen and imported products. If this trend continues it might pose a serious problem for both tourism and local fishermen whose livelihood is already threatened.

The economic value of the New Orleans Coastal Zone depends on the area remaining viable and relatively unchanged at this point of man and nature's adaptive time.

8

Summary

This volume presented a description of the Parish of Orleans, Louisiana. Geographically, the area is very young, having been built up by the Mississippi River some 5000 years ago. Settlement of the area was first confined to natural levee ridges, and then, as technology allowed, to reclaimed marsh and swamp areas. Because New Orleans lies in former wetlands, soils are very unstable and constitute major constraints to urban growth.

Major assets of the New Orleans Area center upon its location in relation to waterborne commerce. The Mississippi River and the Gulf of Mexico provide the setting for the nation's second largest port; surrounding marshes and swamps provide both economic and recreational assets in terms of commercial and sports fisheries, trapping and outdoor activities.

The effects of man however, threaten both the economic and recreational benefits of the city's surrounding marshes. Additionally, current development trends pose threats to consumers as residential development spreads over lowlying, flood prone, unconsolidated soils.

The documentation of conditions in the City of New Orleans is an important step in the coastal wetlands of Orleans Parish. Given the information contained within this report, a second volume has been prepared which presents recommendations as to the sound development of the remaining portions of Orleans Parish.

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